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**ORIGINAL COMMUNICATIONS.**

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**DIAGNOSIS OF BRAIN ABSCESS.\***

DR. FOSTER KENNEDY, New York.

Time was when the diagnosis of brain abscess was fairly academic. In the absence of etiological factors pointing to a source from which abscess formation could take origin, the diagnosis of brain abscess is almost impossible. One can postulate from certain signs and symptoms that an individual is harboring an expanding lesion and one can say where that lesion is; but in the entire absence of ear disease, sinus disease, trauma, or pus elsewhere in the organism it would be rash to make a diagnosis of abscess on mere speed of expanse, because almost the quickest and most acute and expanding lesions within the brain are gliomata into which a hemorrhage has occurred, and they simulate abscess very often. Temperature is almost always absent in abscess cases unless the meninges are involved; in my experience disproportionate drowsiness is the most diagnostic general feature of brain abscess. The hebitude and stupor accompanying brain abscess are usually out of all proportion to the degree of intracranial pressure; whereas in tumor the amount of stupor is usually rather less than one would expect from the tremendous amount of edema, headache, vomiting, etc. Some of you saw a girl, age 15 years, in the Neurological Department of Bellevue with a papilledema of probably 7 diopters. I saw her at Christmas; comfortable and apparently happy at a party of her friends. That

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would have been impossible in any case of brain abscess. A generalized headache with local emphasis is, of course, important in the course of the chronic or acute otitis media, but increasing drowsiness is a still more important feature. Papilledema is uncommon in brain abscess in any particular degree, though a slight change in the fundus is usual; a very little obscuration of the disc may be seen in the nasal margin, but frank papilledema is almost unknown, probably due to the fact that the disease is too short and ingravescent to let it develop. Brain abscess can exist in a static condition in the brain for years if encapsulation occurs; in that event, no papilledema takes place; papilledema is not an inflammation but a mechanical situation whereby the cerebrospinal fluid is forced down the vaginal sheaths of the optic nerve, etc., and unless pressure increases sufficiently the papilledema does not appear in cases of brain abscess.

In talking to an audience of otologists and neurologists it is difficult to find a via media; I may sound dull and platitudinous to neurologists and perhaps absurd to the ear men, so you must bear with me in any remarks on local diagnosis. The diagnosis of abscess is fairly difficult in the absence of a direct lead from the etiology. I will cite a case that was under my vicarious care many years ago in Bellevue. The patient was admitted with the diagnosis of paresis, had much mental change and loss of memory, and he was luetic. He was thought to be paretic, probably because one pupil behaved unusually. I found that he had a little whiteness in the outer border of one disc, and he developed papilledema in the other eye. Now, in the eye in which there was a little pallor, but no papilledema, he became rapidly blind, and although there was no history except of being wounded "in the scalp" two years previously in a saloon scuffle, I made a diagnosis of expanding lesion possibly abscess in the left frontal lobe, on which side he had lost his vision. Dr. Rogers operated—in the face of a good deal of opposition—and he removed 10 ounces of pus from the right frontal lobe. The reason he had lost his vision was, of course, that the abscess was so large and so old that it had come down on the right optic nerve, as a tumor might have done, and prevented fluid being forced along the vaginal sheaths, and damaged the macular bundle of the optic nerve. That situation not having occurred in the opposite eye, he had papilledema there. That was a diagnosis of frontal lobe abscess in terms of an expanding lesion of the frontal lobe. I do not recall whether I made a diagnosis of abscess or tumor, but rather of a frontal lobe situation. The improvement that occurred in the man's mental attributes was remarkable, and no alteration in his personality could be noted a year after

the operation, when he returned, in spite of the fact that we knew his right frontal lobe must have been seriously affected by so much pus.

In a series of 76 brain abscess, 55 were found in the temporal lobe, 13 in the cerebellum and four in the cerebrum, two in the pons and one in the cerebral-peduncle; therefore the symptomatology of the temporal lobe is of prime importance to the otologist, apart from the general diagnosis of abscess, which symptoms are not much more than increasing headache and drowsiness. But the temporal lobe is, of course, a vast uncharted area which can contain gigantic abscesses without very many localizing signs. However, the lobes occasionally are irritated by abscesses and give rise to bursts of subjective sensations of taste and smell. I say bursts, for these are in the nature of release phenomena, like Jacksonian epilepsy—a "burst" of bad smell or a "burst" of bad taste, etc. Then, there are curious psychic phenomena which occasionally come with abscess but are on the whole more likely to be described in tumor cases. They exist in abscess cases, but are much more common in tumor cases; the hebitude of the patients prevents their expression of these psychic features—dreamy states, sometimes hallucinations of figures, animals, birds, flowers, people which are seen by the individual and recognized by the individual as hallucinations, we know that they lack reality but are reality phantoms. I saw a case in the hospital with a left temporal tumor in which the patient every now and then saw in his room "a man" of whom he said: "I believe I had a business transaction with him." That is to say, the figures, although unidentifiable by him, and not capable of being described by him, yet had a curious intellectual attachment to him, for the figure was familiar; he could not say whether the man wore a hat, whether he wore a beard or was clean shaven, but he saw the figure and felt as though he "knew he had had a business transaction with him". That shows the extraordinary intellectual projection that occurs with these voluminous mental states, which, of course, are not as easily described by abscess patients as by those with tumor.

I might mention another case, a woman patient of mine, who said she saw quite suddenly men and women dressed in eighteenth century costume; the women in full skirts with low bodices, and the men in knee breeches and ruffles, crossing from left to right and talking to each other. "Did they look real?" "Yes." "Did you think they were real?" "No." "How did you know?" "I knew they were not real, for they were out of place in a New York apartment." These extraordinarily acute visions that patients de-

scribe always occur in the presence of organic disease in the temporal lobe. One wonders why the temporal lobe should be the origin of these very extraordinary hallucinations; one may wonder why such odd memory projections should take origin from temporal lobe disease. After all, we are each of us microcosms of the race, passing through all its stages in our evolution from egg to adult. The lower animals have much of their intellectual attachments through their swell centers, *i. e.*, their temporal lobes. It may well be that in fetal and infantile life we use these areas to store memories—a function later in life takes one by a more highly organized, more recently acquired mechanism placed perhaps frontally.

The aphasia of the abscess cases, which occur mostly when the disease is on the left side of the brain, is nearly always wrongly described. These patients are not word-deaf; they understand what is said to them; they are word-forgetful. They cannot bring to their recollection memories of words which are exact. If you try to make them say the wrong word, they resent it; therefore, they are not word-deaf, but are word-forgetful, and call things by the wrong name to their own chagrin. They cannot find the right word, though they often find a word something like the one they want; they often get a word beginning with the same letter or one which carries a cognate meaning. It is really an anomia, and sometimes, if not too stuporous, they will talk brilliantly in jargon. Hemianopia, of course, occurs if Meyer's loop is impinged on. I have seen in tumor that interference with the visual field will take place, not in form, but in color, before there is deterioration of appreciation of form. That is something that has to be looked for.

Cerebellar abscess patients, as Dr. King very properly said, nearly always die. The lobulation of the cerebellum curiously facilitates pus running in different directions, so that an abscess once situated in that lobe usually has diverticula. You can find it by the ataxia, not of station, but of limb; ataxia of station, vertigo and nystagmus, and vomiting may all be labyrinthine; they may not be cerebellar at all; but add habitude to that picture and ataxia, not of station, but of limb, and, of course, if you add papilledema, you will have a picture of cerebellar abscess.

A word on epidural abscess. There is almost no rise of intracranial pressure and hemianopia is practically never present. The local signs are very often in the neighborhood of the ears; the attitude and fixation of the head is important. Sinus thrombosis can usually be diagnosed by the high fever, the chills, the local jugular complications, and the enormous change in the blood picture.

Probably the most difficult diagnosis to make from brain abscess, and this perhaps might strike some of you as strange, is diffuse meningitis. That is sometimes impossible to diagnose from localized abscess. In one case it was a great puzzle to me; I was certain he had a brain abscess in the frontal lobe, and yet he had normal spinal fluid. Operation was done and the abscess found, but there was tude, etc., yet in spite of the meningitis signs he had a normal spinal fluid. Operation was done and the abscess found, but there was also meningitis; but it had so glued the spinal membranes in the neighborhood of the atlas that the spinal lake was completely cut off from that in the head, so that our examination of the lumbar fluid was of no importance.

I am afraid I have not thrown much light on the diagnosis of brain abscess. It is a very difficult matter and depends much on the etiological factors, and its outcome depends on the surgeon—and I wish to congratulate Dr. Cahill and Dr. King on their success in this very difficult and ~~very courage~~-requiring field of surgery. Many surgeons shy away from brain abscess, largely because of the mortality rate, but I have seen much of Dr. King's work and know that he will attack any case of abscess confronting him, or any meningitis that might conceal an abscess.

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## NEUROLABYRINTHITIS OF FOCAL INFECTION ORIGIN.

DR. GEORGE W. MACKENZIE, Philadelphia.

In spite of the great amount of combined clinical and laboratory researches thus far made in the field of focal infection by such noteworthy investigators as E. C. Rosenow<sup>1</sup>, Frank Billings<sup>2</sup> and his associates, D. J. Davis, R. T. Woodyatt, H. K. Nicoll, W. E. Post, E. E. Irons, A. M. Moody, F. W. Gaarde, J. J. Moore and Geo. H. Coleman; by R. L. Haden<sup>3</sup>, Will Walter<sup>4</sup>, W. A. Price<sup>5</sup>, Judson Daland<sup>6</sup> and many others, mostly Americans, none of them has made any reference to the hearing and labyrinthine functions having been involved in consequence of focal infection.\* Nor has any mention been made of laboratory animals manifesting lesions of the inner ear or acoustic nerve following the injection of streptococci obtained from a focus of infection in the human, as has been so frequently observed in the case of the eye. For instance, Billings, who is accredited by Rosenow as having placed the "idea (focal infection) on a sound basis about 14 years ago", refers to a long list of acute and chronic diseases secondary to focal infection, but makes no reference to deafness or vertigo nor to any disturbance in the organs responsible for this symptom. Russell L. Haden in his recent effort to bring the subject up to date, refers to 40 conditions as secondary manifestations of focal infection about the teeth, but makes no mention of any disturbance of hearing or vestibular function. Furthermore, from the otological side, scant attention has been paid to the subject of neurolabyrinthitis except by the writer<sup>7</sup> and his associate, Wm. G. Shemeley<sup>8</sup>, in spite of which cases of impairment of these functions are not uncommon.

Concerning the general aspect of the subject, Billings puts it tersely "systemic or general disease due to focal infection is a conception as old as medical knowledge". Benjamin Rush<sup>9</sup> as long ago as 1818 said: "I have been made happy by discovering that I have only added to the observations of other physicians in pointing out a con-

\*Since the preparation of this paper the writer came across a contribution by Geo. E. Shambaugh, of Chicago, entitled, "Primary Diseases of the Labyrinth as the Result of Focal Infection", read before the American Laryngological, Rhinological and Otological Society at Atlantic City, 1917, in which he reports four cases of perceptive deafness with vertigo and diminished reaction from turning secondary to acute or recurring attacks of tonsillitis.

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nection between the extraction of decayed and diseased teeth and the cure of general diseases." He also emphasized the fact that such teeth need not "be attended with pain in order to produce diseases". It was William Hunter<sup>10</sup> who introduced the term "oral sepsis", ascribing to it a long list of general diseases. He believed that the spread of the infection was by the hematogenous route. Since the memorable monograph of Billings much has been written on the subject of focal infection, mostly confirmatory in character, even to detail.

A focus of infection consists of a circumscribed area of infection which is capable of producing secondary manifestations in another part of the body, often quite distant from the primary focus. The focus may be situated almost anywhere, but more often about the teeth, tonsils, sinuses, ears, gastro-intestinal and genito-urinary tracts. When the infection at the primary focus is very acute and active, the secondary manifestations are prone to be acute and active. Illustrated by an acute streptococcal infection of the tonsils, followed by acute rheumatic fever and endocarditis. The secondary manifestations in this class of focal infection, are due to the presence of the actual bacteria at the site of the secondary lesions, which have found their way from the primary focus by the hematogenous route.

In another group of conditions, including that covered by the title of the paper, the infection at the primary focus is one of comparatively mild strain. In fact the local reaction is so mild as to produce practically no symptoms referable to the focus. Furthermore, the secondary manifestations are milder than those of the former group illustrated by the endocarditis. As to these milder cases of focal infection, the writer has held to the opinion that the secondary manifestations are produced by the action of bacterial toxins generated at the primary focus, which find their way first into the lymph stream and then into the blood circulation, producing apparently no general ill effects except in the particular tissue or organ for which the *toxin* shows a selective action, a characteristic which is common to all poisons. This selective action of bacterial toxins must not be confused with the elective affinity of bacteria.

The elective affinity of certain strains of streptococci for particular organs was first proved by experiments on animals by Rosenow. His results have been confirmed and amplified by others, notably Price and Haden; they are briefly told in Table I of this paper. It shows that the streptococci taken from the different diseased organs show a marked tendency, when injected into animals, to select the same organ from which they were isolated in the human. For in-

stance, 14 different strains taken from the involved appendix of as many different humans produced lesions in the appendix in 68 per cent of the animals injected with the virus; whereas, streptococci selected from elsewhere than the appendix produced appendicitis in but 5 per cent of the injected animals. This elective affinity of the streptococcus for the same organ in the injected animal as that from which it was taken in the human is apparently self-evident. The streptococcus when injected into the blood stream of the experimental animal finds its way into all parts of the organism. That a greater amount of reaction is produced in one particular organ in preference to all others does not prove that the bacteria actually seek out that organ, so much as it proves a greater vulnerability to the toxins generated by the bacteria. This susceptibility of an organ to bacterial toxins is very evident in the secondary lesions of focal infection in the human in those cases where no bacteria have been found. No one, so far as the writer is aware, has conducted any experiments upon animals with toxins of bacteria injected into their circulation to prove or disprove their selective action; in lieu of which, we are dependent for the time being upon clinical experience solely, which tends most strongly to show that the selective action of bacterial toxins is very definite. On the other hand, this selective action on the part of a toxin for a particular organ or structure does not imply that other organs and structures are not affected at all; for, on the contrary, they are, but to a much less degree.

The writer is inclined to believe that what appears to be an elective affinity of certain strains of streptococci for a particular organ or tissue is nothing more than an increased susceptibility of that organ to the bacterial toxin. Furthermore, if the secondary manifestations are due to the actual presence of the streptococcus, for instance in the inner ear, how could their elimination at the primary focus wipe out their presence in the ear and bring about such rapid and marked improvement in the hearing and labyrinthine functions, so often observed in this class of cases?

Focal infection neurolabyrinthitis presents clinically both general and local symptoms. The general symptoms are due to the widespread diffusion of the bacterial toxins generated at the primary focus; whilst the local symptoms are those referred to the inner ear and eighth nerve, because of the selective action of the bacterial toxins for those structures. Among the more general manifestations of focal infection may be mentioned a general depression of health, lowering of the blood pressure, lack of "pep", or ambition, pallor of the face, the result of the diminution of hemoglobin and of red blood

cells, relative lymphocytosis, rheumatoid pains in different parts of the body, vague gastro-intestinal symptoms and other rather indefinite symptoms. Indefinite because the pathologic-anatomic changes responsible for them are not sufficiently well developed to produce more definite symptoms. The local manifestations referable to the ear, on the contrary, are quite definite. They include deafness of the perceptive type, indicated by a diminution of the hearing function to both air and bone conduction for all pitches, including the high tones, and a diminution of the labyrinthine function, indicated by the presence of spontaneous nystagmus directed away from the affected side, diminution of the after-turning nystagmus toward both sides, particularly the affected side, and diminution of the electrical reaction on the same side.

Although neurolabyrinthitis of focal infection origin tends to be unilateral, involving both the hearing and the labyrinthine functions, cases are found in which the hearing function suffers more than the labyrinthine, and other cases in which the labyrinthine function suffers. The surest way to establish the diagnosis is by the therapeutic test. In other words, if a case comes to us in which the local and general symptoms speak most strongly for a focal infection neurolabyrinthitis and the eradication of the suspected focus is followed by very prompt and exceptional improvement without further recurrences, the diagnosis is established as certainly as it is possible to be clinically.

If the time permitted, the writer would like to read somewhat in detail the report of some cases. Instead he will, with what time is left, present the report of a single typical case.

*Case:* M. R., male, age 36 years. First seen Oct. 24, 1927.

*Anamnesis:* About two years ago the patient experienced his first attack of vertigo while walking along the street. It came on suddenly and startled him. He was forced to hold on to a building he was passing for fear of falling. Since that time whenever he has an attack of vertigo, he is compelled to sit down quickly for fear of falling. During the attacks everything about him seems to be "moving around". He complains of slight impairment of hearing on both sides. During the attacks of vertigo the patient perspires freely and is nauseated. He has never been entirely free of vertigo since the first attack; however, there are periods when the attack is considerably worse than usual. He has seen many doctors, including internists, neurologists and otologists, along with the average run of family physicians. One of the otologists who examined the patient in-

formed him that he had a brain tumor and advised him to see a brain surgeon to have the tumor removed. This the patient was unwilling to do, and when he reached me, he was suffering considerable mental anguish and was on the verge of attempting suicide. He has had a number of teeth removed, following which he claims to have had a streptococcal infection of the throat, which put him to bed for about six weeks. Rheumatism followed the throat infection and lasted for four months. The patient claims to have had more dizziness following his extraction than before. He has been up and around for the last three weeks. Some of the doctors have suggested a tonsillectomy, but he is waiting until he gains more strength.

*Examination for Spontaneous Nystagmus:* When looking to the extreme right, there is pronounced rotary horizontal nystagmus to the right side, with the rotary element predominating.

When looking to the extreme left, there is a mixed rotary horizontal nystagmus to the left side.

The nystagmus to the right is decidedly more pronounced than the nystagmus to the left.

There is very slight nystagmus to the right when looking straight ahead, 1 m.m. length at the equator of the globe, repeated every fourth second.

#### GALVANIC TEST.

Right Ear.	Left Ear.
Kathode 3 ma. rotary nystagmus to the right is increased.	Kathode 4 ma. rotary nystagmus to the left.
Anode 6-7 ma. rotary nystagmus to the left.	Anode 3 ma. rotary nystagmus to the right.

#### FUNCTIONAL HEARING TEST.

Right Ear.	Weber	Left Ear.
Normal	Schwabach	Indifferent; questionably short.
-15"; -15"	Rinne	Short 5"
Slightly short.	C <sub>1</sub>	-5"; +3".
Very slightly short; normal.	C <sub>4</sub>	Slightly short.
Short 31"; short 27"	Air	Normal; very slightly short.
		Short 30"; short 24"

*Otoscopic Examination: A. D.:* After removing a slight amount of cerumen from the external canal, the tympanic membrane is seen to be intact and slightly dull. There is an atrophic scar involving the larger part of the anterior half of the drum head and a fair part of the posterior half. There is a slight retraction indicated by the pathologic posterior fold so often seen in retracted drum heads. With

the Siegel instrument the membrane moves in excess of the hammer handle, with overlapping of the stria malleolaris.

*A. S.:* Membrane intact, brilliant, appears slightly atrophic posteriorly; normally translucent. The long process of the anvil can be readily discerned through the intact membrane. Mobility of the membrane with the Siegel instrument is quite normal. With Politzer inflation the membrane comes out promptly over a large area and returns to its primary position slowly.

*Examination of the Nose:* Examination of the nose reveals a deviation of the septum to the right side. Mucous membrane is pale and succulent. There is no gross evidence of sinus disease detectable by rhinoscopic examination.

Examination of the alveolar process shows an absence of many teeth, confirming the patient's history. The remaining teeth are in questionable condition, and an X-ray examination was suggested. This was made by Dr. Post, whose findings read as follows:

"Many teeth are missing. There is remaining upper right second bicuspid, first molar, upper left first and third molar. There is a fixed bridge abutting on lower right cuspid and first bicuspid. The lower right lateral incisor is missing. There is remaining yet the lower left incisors, cuspid and bicuspids. Pyorrhea involving lower remaining incisors."

*Throat Examination:* Examination of the throat reveals the presence of submerged tonsils with anterior pillars red and slightly thickened both sides. The crypts contain cheesy collections and thin purulent secretion.

*Turning Test:* After 10 turns to the left there is a horizontal nystagmus to the right, lasting for 25 seconds.

After 10 turns to the right there is a horizontal nystagmus to the left, lasting for 20 seconds.

*Maddox Rod Test for Distance:* No vertical imbalance. One degree esophoria.

*Eye Muscle Test:* Red cover tests for eye muscle paresis reveal no involvement of any of the extra ocular muscles.

On Nov. 7, 1927, the tonsils were removed under a general anesthesia. Under the same anesthesia the dentist attempted to remove the fragments of roots, but failed. A subsequent attempt by another dentist was successful; however, not entirely so, for Dr. Post was able to detect by roentgenological examination the presence of residual pathology. His report reads as follows:

"Re-examination of the edentulous area of the lower right second molar region of Mr. M. R. reveals evidence of the following: There is a small crescentic-shaped shadow of bony density which I believe is a loose sequestrum formation in the alveolus."

At least two other attempts were made by the same dentist, who became disgusted with the persistence in the residual pathology, which he did not believe existed, in spite of Dr. Post's interpretation. In the meantime several differential blood counts were made by Drs. Wagenseller and Kolmer, every one of which showed the characteristic blood findings of focal infection. The following is a sample copy of report forwarded by Dr. Kolmer:

"Feb. 24, 1928. Leukocytes, 9,400; differential count: small lymphocytes, 40 per cent; large lymphocytes, 6 per cent; transitionals, 3 per cent; polymorphonuclears, 50 per cent; eosinophiles, 1 per cent; basophiles, none; abnormal erythrocytes, none; abnormal leukocytes, none."

The persistence of the vertigo, together with the nystagmus to the right side and the imbalance of the electrical reactions along with the repeated blood findings of focal infections and the repeated X-ray findings of residual pathology, caused the writer to insist on the thorough cleaning up of the infected alveolar process, believing that by so doing all symptoms and findings listed above would promptly clear up. After several conferences with the patient I was able to hold his faith sufficiently long to see that the focus of infection was cleared up in the alveolar process. After a last attempt at cleaning up the focus, Dr. Post gave his approval of the work on the alveolar process based upon a careful X-ray study.

The patient experienced 1. a feeling of general improvement in health, 2. the cessation of vertiginous attacks, 3. an improvement in hearing, 4. a cessation of nystagmus when looking straight ahead, 5. an improvement in the differential blood count.

A more full report of the case is impossible in a paper of this kind, but will be reserved for some future occasion.

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## ATYPICAL MASTOIDITIS. REPORT OF CASE, WITH COMPLICATION OF DEEP ABSCESS IN TEMPORAL FOSSA, BEGINNING AS SUSPECTED ACUTE PAROTITIS.\*

DR. MAX M. KULVIN, Chicago.

Atypical mastoiditis apparently is no longer a rare condition, especially during the last 10 years, for a resume of the literature presents concrete testimony to the ever-increasing watchfulness of the attending physician or otologist. A review of practically all cases reported during this period bases the atypicalness of the mastoiditis almost unanimously on the absence of a discharging otitis media with pain and edema over the mastoid.

George MacKenzie says that any case of middle ear suppuration tending to spread beyond middle ear cavity and yet presenting few, if any, of the classical symptoms of mastoid empyema may be considered an atypical mastoiditis. His explanation for such a development is:

1. The presence of a thick, unyielding drum membrane.
2. A thick, resistant external plate of mastoid.
3. An abnormally vulnerable inner upper or lower wall of middle ear cavity, mastoid antrum or mastoid spaces.

The following case seems somewhat different, in that a discharging ear was present, there never had been any signs of mastoid involvement, and yet an incision of an abscess in front of the ear led to the discovery of a complete mastoiditis, involving all cells, including zygomatic. This boy, age 13 years, was brought to the Stephanie Hospital, Budapest, Dec. 19, 1927, because of a discharging left ear and a swelling in front and below the left ear. About four or five days previous he had a Sluder tonsillectomy and adenoidectomy performed. The child was running a temperature, did not seem sick, complained of no pain anywhere. There was no edema or tenderness over the mastoid, but a swelling, boggy not large, in front of the auricle and below at the angle of the jaw. This mass was tender and made it difficult for the boy to open his mouth. The location of the mass, the tenderness and the absence of any signs or symptoms involving the mastoid led tentatively to a suspicion of acute parotitis.

\*From clinic of Prof. Marc Paunz, Stephanie Hospital (University Clinic for Children), Budapest. Director, Prof. John De Bokay.

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There was a daily variation and fluctuation in the temperature of a slight amount. The swelling did not subside, but gradually increased in size. Jan. 2, 1928, slight fluctuation in the swelling was obtained. Jan. 5, 1928, an incision was made at the point of fluctuation, just below the zygoma, with the release of a wine glass of pus. A probe in the wound could be carried upward into the temporal fossa, while along the under-surface of the zygoma the bone was rough, where the periosteum had been stripped off by the infectious process. This demonstrated that a subperiosteal abscess with mastoid destruction was present. A drain was inserted and the patient returned to bed. An X-ray taken very soon after showed complete involvement of the mastoid structure.

On Jan. 13, 1928, a Schwarze operation was performed, disclosing destruction of all cells in the tip, behind the sinus and very far forward in the zygomatic roof. This mastoid cavity was that of an adult, rather than a child. Complete recovery took place. The bacteriological examination showed pneumococci as the predominating organism.

*Comment:* The factors of interest in this case were the formation of a deep abscess in the temporal fossa, the resemblance of the process to an acute parotitis and no evidence tending to suspect a mastoiditis, despite the presence of a discharging ear.

Mollison, in the *Journal of Laryngology and Otology*, of November, 1922, explains the mechanism of the spread of infection in the temporal fossa as the result of development of cells in the outer attic wall toward the root of the zygoma spreading suppuration, or in the absence of cells, infection of the diploëi is sufficient to account for disease spreading forward and leading to the formation of a subperiosteal abscess, because in the posterior part of the temporal fossa the fibres of the muscle run almost horizontally and are fairly tightly bound down to bone, while in the center of the fossa the fibres are vertical and give more room for pus to collect underneath. Infection, furthermore, is likely to be spread by the blood vessels passing through bone to the periosteum, as often infection is found in the middle of the temporal fossa, separated from areas of sepsis in the bone by healthy tissue.

Absence of pain, tenderness or edema over the mastoid process in the presence of a discharging ear should not mislead the examiner from keeping the possibility of a mastoiditis in mind. X-ray examination is advisable even in the early stages of a mild suppurating otitis media.

## REMINISCENCES OF A FEW UNUSUAL FRONTAL SINUS CASES.\*

DR. SAMUEL R. SKILLERN, Philadelphia.

The first case that I remember was one for which I gave the anesthetic while I was a sophomore in medical school.

The patient was a young woman, age about 25 years, who had been suffering with chronic frontal sinusitis for several years, and a radical operation was necessary. After the usual preparation, the patient was brought to the operating room and I began pouring ether. My brother and an assistant did a very complete and thorough Killian, finding the usual necrotic, polypoid, degenerated mucous membrane, with a quantity of retained pus.

The operation finished, we decided to go to the baseball game as it was a fine spring afternoon. On our way home from the game we stopped at the hospital to see how our patient was doing, when, much to our horror, we found her not only still under the anesthetic, but in a state of collapse. Ross wisely thought an older head to be essential and so I was dispatched posthaste for our father, an old practitioner. I shall never forget father's words when he saw the case; he turned to Ross and said, "My son, this patient is dying", and, being the wonderful old physician that he was, he proceeded to instigate the proper treatment to save her life and after an anxious night the girl responded and eventually made a perfect recovery, except for a diplopia, which was most marked when descending the stairs. This was treated by oculists, but subsequently it required the secondary Killian operation 10 years later to cure this condition. I am sure that this taught both of us the great necessity of replacing the muscle as nearly as possible in its original position.

Since this girl's second operation, we have made it a point in finishing the Killian always to pick up the outer edges of the superior oblique muscle and tie the tendon to the internal angle of the supra-orbital ridge.

The next case was that of a young man, age 36 years, who had been hospitalized and operated upon for chronic ethmoiditis. It was a private case of my brother's and, as his cases often do when he is called out of town or for any reason is unable to get to the hospital,

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proceeded to have an acute complication. I was called at 3 o'clock in the morning and told that this man was in a wild delirium and that it was not only necessary to put on a restraining sheet, but to cross-eagle him with handcuffs and ankle-straps to hold him in bed. As the X-ray pictures had shown a chronic frontal sinusitis and as Ross had expected to do a radical frontal, I did my first modified Lothrop on this patient without the presence of his guiding hand.

Upon opening the frontal sinus, I found an acute exacerbation of a chronic condition with pus under pressure. As soon as this pressure was relieved, the patient ceased groaning as he had been doing under the anesthesia and after a quiet convalescence, much to my gratification, made a permanent and complete recovery.

As I had been attending all of the hospital cases for several days and had noted increasing headaches in this patient, we felt that under like conditions the sinus should be opened earlier.

Cases 3 and 4 I will merely mention, as they were reported at this Society meeting in Washington last spring and they appeared in the September number of the Annals. The 16-year-old boy was without a doubt the most virulent infection we have ever had in the clinic. It appeared to be under control several times and this boy would be gaining in health and strength, when like a thunderbolt out of a clear sky it would burst forth in some new area. You will very probably remember that this case was reported as death from cerebral abscess.

The fourth case died of general pneumococcemia after the complete healing of the orbital wound. Personally, I have always felt that this case was harboring the pneumococcus when he entered the hospital, and it only required the lowering of his resistance to allow it to get in its ravages. The usual precautions were taken to keep the patient's skin warm when on the operating table and during his postanesthetic period and, as there was very little bleeding at the time of operation we cannot conceive of his acquiring this infection while in the hospital. It seems a peculiar thing that, when a patient while in a hospital, under not only a physician's care, but under competent nursing as well, and with all precautions that are humanly possible to take against this dreaded infection, it should occur, and yet it often does.

If there is anyone here that can give us any light on this subject, we would greatly appreciate it; not that we have this occur any oftener in our clinic than any other, but it occurred in my immediate family, consequently I am possibly more interested.

Having reported two deaths and fearing that you all may feel that most of our cases end up with a "wooden overcoat", I am going to mention two cases that made beautiful recoveries.

The first, a young lady, age 32 years, had all the symptoms of chronic frontal sinusitis on the right side. I am not sure that you gentlemen know that the Skillern Clinic prefers the modified Lothrop operation to the Killian procedure and that we make the Lothrop a two-stage operation. The first step consists of the removal of the anterior end of the middle turbinate and all diseased or obstructing ethmoidal cells that may be interfering with drainage of the frontal sinus, special attention being given to agger-nasi and infundibular cells. If we find that the posterior ethmoidal or sphenoid sinuses are infected, we open them at this sitting. This is done under local anesthesia with the patient in the chair. In this way, in a number of cases, we procure drainage and aeration in order to relieve the frontal sinusitis. In the case just referred to this was done and the patient was relieved for about three months. As often occurs in this primary operation, the sinus again became occluded by the formation of granulation tissue and it was necessary to do the second step of the operation, namely, the opening of the frontal above the supraorbital rim. The sinus was found to be filled with the usual necrotic polypoid mucous membrane with some pus, which was not under pressure, showing that there still remained some drainage and I believe her pain and headaches were due to the impinging diseased mucous membrane. A quiet uneventful recovery was made with to date a perfect result. The second case, a veteran of the World's War, gave the usual history. His primary operation did not relieve him, consequently the second step was necessary. This young man had a very large frontal sinus with a septal wall about the size of a large pea; this was infected. As I was not sure from the X-ray plate of the condition of the adjoining frontal, I opened up a breach in the septum and found this sinus in a healthy condition. With the sphenoidal punch, I bit away the intersinus septum as far downward toward the nose as possible. We have never had a healthy sinus to become infected from a diseased fellow following the opening of the intersinus septum, and as we all know that no matter how much we may enlarge our ostium of the diseased sinus, it will in time become more or less occluded by granulation tissue, consequently we feel that in opening the breach in the septal wall, we are allowing aeration to occur in both sinuses through the normal ostium of the healthy sinus.

Our idea in operating on sinus conditions is, first, to cure the condition and, secondly, to allow the sinus to return to as near normality as possible, and even though the enlarged ostium of the diseased side may become complete and permanently occluded, we still have a normally functioning frontal sinus through the destroyed septal wall.

The next was a case that I was called to see in another city; a boy, age 18 years, who gave a history of being perfectly well until 16 days before I saw him, at which time, following an afternoon in swimming, he developed a severe frontal headache. His family physician had treated this with analgesics. Ten days later an abscess occurred about an inch above the inner angle of the eyebrow, which was opened and drained. The following day, a temporal abscess required opening and when I saw him on the sixteenth day, there was a piece of rubber tubing which had been carried through and through under the skin for drainage of the frontal area. The boy was in a moribund condition, but could be aroused to answer questions. His cerebration was extremely slow and he would oftentimes say "No", then shake his head and, after a considerable pause, say "Yes" to a question. The temperature had been hovering between 101° and 104°. The laboratory findings showed an anemia, with a high leukocyte count, and the urine showed numerous granular and hyaline casts, with a good deal of albumin. There was a decided myocarditis and I felt that the boy would soon pass into the Great Beyond unless something was done immediately.

The usual eyebrow incision was made and a second incision run upward to the abscess drainage opening in the center of his forehead. When the skin was dissected upward the muscle and fascia around this opening was found to be quite necrotic and there was a perforation of the anterior plate just below the abscess formation. Upon dissecting upward of the periosteum and soft tissues, another perforation in the frontal plate was found at about an inch above the center of the eyebrow. This, I suppose, accounted for the temporal abscess. When the anterior plate of the frontal sinus was removed, the bone about these two perforations gave the feeling that one might have in curetting through a mixture of cheese and coarse sand. The posterior plate contained four necrotic areas, varying in size from a pin head to a large pea, and so much curettage was necessary in these spots that my assistant afterward told me that each time I curetted he would hold his breath in fear that the curette would enter the cranial cavity.

Up to this time this had been the most difficult case that I had ever encountered. The intranasal drainage tube was left in situ for 12 days, with irrigations of 1 to 5,000 bichlorid of mercury through this tube each day. I am happy to report recovery.

Last, but not least, is a case that I dislike to recall, as the family put such absolute confidence in me that when I failed them I felt as though I had actually committed murder. Never in my experience

have I seen such a terrific case of pansinusitis as this 42-year-old woman had. As her previous history is somewhat interesting, I shall give you a brief resume of it. She stated that in March of 1926 she contracted a severe head cold, which developed into a mild attack of influenza. Six weeks later a severe frontal headache occurred, which persisted for about 12 days, when a swelling appeared over the inner canthus of the left side. This was opened by a surgeon, who told her it was an abscess beneath the skin and that the bone under it was perfectly healthy. As her headaches persisted, she was advised to see a rhinologist, who amputated the middle turbinate and opened some of the anterior ethmoidal cells. This, she stated, relieved her headaches. She gave her history as having weighed 158 pounds before her illness. Her weight at the time of my examination was 69 pounds, which is rather unusual for a woman 6 feet 1, with a large, bony framework.

Intranasal examination showed a degenerated mass of sloughing scar tissue, with all landmarks obliterated in the region of the left ethmoid. Both maxillary sinuses were filled with pus and they had a wick of drainage tube in the opening through the skin of her forehead; this, she stated, she had worn ever since this abscess had been opened. The X-ray negatives showed frontal sinuses extending outward for a half-inch beyond the outer orbital rim and upward into the hair line of the forehead, which was quite high. The right ethmoid showed cloudiness and the left side a mere cloudy blur. Both sphenoids were involved.

I told the family of the seriousness of Mrs. G's condition and stated that I would operate only as a life-saving measure, but that I feared death either on the operating table or immediately following. This patient was put in the hospital under a competent internist for a week's preoperative treatment. During this period, the night nurse in charge called my attention to some irrationality on the patient's part, such as complaining of being kept awake by fire engines outside her window.

The first step that I attempted was the removal of some of the sloughing scar tissue from the ethmoidal region. As I have stated, all landmarks were obliterated by this scar tissue, consequently I proceeded, with the utmost care and skill at my command, to pick out with a small Luc forceps some of the material that was causing occlusion around the nasofrontal duct. In doing this I opened a rather large frontoethmoidal cell, which contained a yellowish-white, thick, creamy pus under pressure. I next packed this area with a hot silvol solution on a cotton tampon, which I allowed to remain in

for three hours. That night the patient's irrationality was more marked. This symptom increased, although there was no other sign of a meningitis present. The temperature remained normal throughout. On the third day, under general anesthetic, the left frontal sinus was opened. A perforation large enough to insert one's thumb was found at the maxillofrontal articulation and extending upward and outward. Upon removal of the anterior plate, a tremendous amount of necrotic polypoid mucous membrane was encountered; in fact, the entire sinus was filled with this material. A large septal cell was opened, which contained fully a half-teaspoonful of pus under decided pressure. In the area surrounding the perforation, the bone was necrotic outward in all directions for nearly three-quarters of an inch. In fact, the nasal process of the maxillary was necrotic as far down as the lachrymal bone and one-half of the supraorbital rim came away in the forceps as a sequestrum. On examination of the posterior plate, a perforation the size of the head of a pin was found, which, when enlarged, opened directly under the dura. Curettement in this area showed the dura bound down, walling off this pocket of pus. The toilet of the wound was finished as rapidly as possible and the patient returned to bed, where she died 18 hours later without regaining consciousness.

I believe that this woman was just in that state of balance in which any sudden shock or lowering of the resistance would allow the toxins of her infection to overwhelm her and if I had this case to do over again, I believe that I should do the frontal first and not attempt any ethmoidal procedure whatsoever, as I feel that the ethmoid operation was the cause of her death.

1734 Pine Street.

## CYST OF THE LEFT ETHMOIDO-FRONTAL REGION.\*

DR. G. F. OBERRENDER, New York.

The patient was admitted with the following complaints: 1. Pain and swelling about left eye. 2. Double vision.

The important facts of the history follow: Five years ago a swelling appeared in the inner angle of the left orbit, on the lateral nasal wall. It was non-painful, and very slowly growing. An intranasal operation was advised and performed at that time, with complete, though temporary, reduction of the swelling. Two years later the swelling again appeared, accompanied by definite tenderness of left upper lid. After four months of very slow development, there was sudden increase in size, and in two weeks' time it was about the size of a hen's egg, practically obliterating the inner angle of the orbit. The patient did nothing about this and allowed conditions to remain until two weeks before admission when, without any visible increase in size of the swelling, the eye seemed to be displaced downward and outward, diplopia resulting.

The family history was not indicative, she having two daughters alive and well, admitting of no miscarriages or still-births, and her husband having died of heart trouble. Wassermann was negative. Sinus plates were reported as showing "thickening of left frontal-sinus area, probably not fluid". Intranasally, a large, tense, cystic-like mass could be seen occupying exactly that area usually occupied by the middle turbinal body. A clinical diagnosis of "cyst of the ethmoid region" was made and operation via external route performed. In as much as the technique of such a common external operation is universally known, only the findings are here presented. The chief points were:

Directly beneath the skin a bluish-walled cyst was exposed. The nasal bone on the left side had been entirely eroded, as well as that portion of the orbit adjacent and the floor of left frontal sinus. It was further noted that cyst occupied both frontal sinuses with the exception of the extreme right third of the right frontal, the left anterior and posterior ethmoids. In the ethmoidal region, however, it lost its cystic character and resolved itself into a soft, indiscrimi-

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inate tumor mass. No attempt was made to remove this non-cystic part, but it was noted on record that it was suggestive of a gumma or a degenerative sarcoma. Pathological report was as follows: " \* \* the tissue shows extensive hemorrhage and localized round and plasma cell infiltration, plasma cells predominating. These cells generally occur in collections which surround the blood vessels, which in places are numerous. Included in the membrane are particles of degenerated bone and cholesterol spaces bordered by giant cells. A few of the large arteries show intimal thickening. Smaller vessels show same general condition. There is no definite evidence of tuberculosis or syphilis, though the vascular changes and the degree of necrosis unassociated with suppuration suggests the latter disease".

Post-operative course was significant. On the fourth day the lower half of the wound had a red indurated appearance and on the seventh day the wound edges parted. There was no suppuration, simply a separation of the edges of the wound, and no apparent attempt to granulate. Antiluetic treatment was immediately started (as this was coincident with the pathological report) and within  $2\frac{1}{2}$  weeks the wound was closed. She has been subjected to a vigorous and prolonged course of antiluetic treatment and has been very well as far as her head is concerned. Two spinal taps have been negative for syphilis.

This case is presented only because of the relative rarity of cysts of the ethmoid. It would seem that this was a cyst of luetic type originating from the left ethmoidal labyrinth, spreading into the frontal sinuses and finally into the orbit.

120 East 75th Street.

## TWO CASES OF THYROTOMY.\*

DR. J. D. KERNAN, New York.

I am sorry that only one of the patients came here tonight, for I wanted to contrast the two. One thyrotomy or laryngostomy was done on a child whose larynx never developed; the other was done on an adult in whom the larynx had developed.

The case that came was a young man age 23 years. At the age of 2 years he had diphtheria and was tracheotomized; for that he came to me at the age of 13, still wearing his tracheotomy tube. A laryngostomy was done, and all that was found of the larynx was the thinnest imaginable line of mucous membrane lining a passage which admitted a small probe. This was split up as far as possible to give an opening into the pharynx, and was kept open with rubber tubes, so that ultimately a shallow trench was created leading down from the pharynx to the tracheotomy tube. There was no possibility of closing over the trench to give him mouth breathing, for the trench was so shallow that there would not have been room for him to breathe at all; so it was necessary to build some sort of new larynx. That was done by using costal cartilage (demonstration on board).

That gave the elevation on each side, so that in place of the shallow trench we had a deep one. Then it was possible to experiment in the way of closing it; so a piece of costal cartilage was planted on each side; and when that had grown into place, this flap was cut loose and turned over the larynx; and then the skin from this side was undermined and pulled over to cover the raw surface from the other side. Then this resulted with the upper part of the trench closed.

You doubtless noticed that the lower part of the wound bulged as he talked. That was due to the fact that in closing this part I used merely the skin of the neck without using the cartilage in the flap, and the skin stretched and he has that unfortunate closing; but he has a voice, and it seems to be getting better all the time. He has reached his full size from the age of 13 to 23; now his neck has gotten larger, and the whole thing is enlarged, so that he has developed a regular adult bass voice.

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Another unfortunate occurrence was that the hair has grown inside of his larynx. I tried to do away with that, and he had exposures of X-rays to kill the hairs. If you looked inside the throat, you may have seen some hairs there that once in a while call for removal by tweezers. In handling such a case, of course these are the things that have to be borne in mind, and in handling such a case you would have to try to get the whole thing covered with cartilage and try to have all the hairs killed, so that there would not be that unfortunate condition.

The other patient was a grown man of 22; the cause of his trouble was not known. He became hoarse and grew more so and had more difficulty in breathing, and finally his larynx filled up so that he could not breathe any more. The diagnosis of the pathologist was chronic inflammation. I took repeated large sections, and had his blood examined frequently for syphilis and never found anything. The Wassermann report was always negative, and the pathologist always reported chronic inflammation.

The inflammation extended down the trachea and into the bronchi in this case, so that every once in a while I have to bronchoscope him and stretch the trachea and main bronchi to enable him to breathe. I was three or four years getting him dilated, but ultimately I got a deep trench. That was because he had a fully developed larynx and it was a comparatively simple procedure after we had formed this deep trench to close it over. I am sorry he did not appear, as it was a very successful case. I got rid of the hair, and having the wings of his thyroid and cricoid cartilages present there was none of the bulging present which is so disagreeable in the other case.

120 East 75th Street.

## A CASE OF LARYNGECTOMY.\*

DR. J. W. BABCOCK, New York.

B. H., male, kitchen man, Dutch, age 55 years, complained of hoarseness of six months' duration. Used patent medicines and saw a physician without benefit. Examined at University and Bellevue Clinic and biopsy taken with the section showing papilloma with malignant degeneration. Other history, and examination, except that of the larynx, was entirely normal. Wassermann was negative. Blood count showed a slight anemia. Radiograph showed lungs negative for tuberculosi or metastatic foci.

The larynx showed extensive papillomatous masses on and under both cords and filling the anterior commissure, which seemed too extensive to warrant thyrotomy and excision. No cervical lymphadenitis was observed.

On Aug. 31, 1928, a laryngectomy was performed without entire removal of the epiglottis and without cervical lymph-adenectomy. Local anesthesia was used for skeletonization of the larynx and chloroform was added after opening the trachea. The cricoid ring was sutured to the skin at three points, as it should serve as a better support to a fistula than a tracheal ring, and a nasal feeding tube was inserted part way down the esophagus. Closure of the pharynx proved not difficult and no leakage occurred. The feeding tube was removed on the thirteenth day and the wound was healed in one month, with very little drainage while healing. The patient was given an artificial larynx, but he never could learn to use it. Also, he has not been able to dispense with a tracheotomy tube permanently. Although he can do without it for hours, the fistula contracts so that its reinsertion is difficult later.

The pathological report by Dr. McWhorter was as follows:

*Macroscopical Examination:* Specimen consists of a complete larynx, without the epiglottis. On opening the larynx there are many papillomatous growths extending from the anterior angle of the vocal cords, posteriorly almost to the arytenoid cartilages. These growths extend under both vocal cords and stretch the cords so that they practically touch in the midline. Most of these growths seem to have pedicles.

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*Microscopical Examination:* Sections taken from different areas show papillary masses of hypertrophied epithelium. There is no evidence that this hypertrophied epithelium has infiltrated the deeper tissues. The epithelium is infiltrated with polymorphs, and also the submucous tissue.

*Diagnosis.* Papilloma (multiple). This startled me at first, as I thought that I had unnecessarily subjected a man to a laryngectomy and I felt sure that a part of the gross specimen was hard enough to warrant the diagnosis of carcinoma. Dr. Symmers assured me that he thought the operation was entirely justified on account of the biopsy report, and that, even without this report, with such an extensive mass of papilloma present, laryngectomy was the safest procedure since malignant change was almost inevitable.

A photograph of the specimen is appended.

The patient found some difficulty in securing employment at first, but is now supporting himself by working in the kitchen of one of the large hospitals in the city.

This case seemed of enough interest to report because of the smooth convalescence, doubtless largely due to the lack of necessity of opening and contaminating adjacent planes of the neck, and the discrepancy between biopsy and post-operative pathological findings.

20 East 53rd Street.

## THE VALUE OF BRONCHOSCOPY IN THE DIAGNOSIS AND TREATMENT OF ASTHMA.\*

DRS. LOUIS and RAY K. DAILY, Houston.

The pathology of bronchial asthma was for a long time believed to be a spasm or the bronchus and a swelling of the bronchial mucosa. Since attacks of asthma are transitory in character and of themselves rarely fatal, the pathology, if there is any, of the bronchial mucous membrane could not be ascertained until the invention of the bronchoscope, which permits direct inspection of the mucous membrane and local treatment. In 1907 Nowotny treated a case of asthma through the bronchoscope and reported favorable results. Since then numerous bronchoscopists have reported their observations in such cases. The interesting feature of these observations is the varied pathology found in various cases. Ulceration of the trachea and bronchi, bronchial obstruction by a scar-like mass, rhythmic contraction of the bronchus, congestion and swelling of the bronchial mucosa, urticarial patches in the bronchi, cyanosis of the bronchial mucous membrane, a chronic tracheo-bronchitis with a variable quantity of secretion, tracheal collapse during expiration,—all these have been seen by various observers. Obviously the bronchoscopic picture of asthma is not constant, and asthma as a symptom cannot be ascribed to a definite pathologic picture. It is also interesting that the orthodox pathology of bronchospasm has never been observed. In 1914 Jackson reported relief of asthma in two patients following the bronchoscopic aspiration of secretions. Diagnostic bronchoscopy has been practiced extensively in his clinic, and cases of cancer of the bronchi, epithelioma of the trachea, compression stenosis of the trachea, foreign body in the bronchi were found among patients diagnosed and treated as asthmatics. Bronchoscopic treatment consists in aspiration of the secretions, and introductions of some bland or soothing medication. Some observers have reported good results with vaccines made from the aspirated secretion, when previously vaccines made from the patient's sputum and stock vaccines have been valueless.

We have examined and treated 12 cases of asthma, of which we were able to follow seven, brief reports of which are as follows:

B. L., colored, age 35 years. Had asthma for the last five years.

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Has been treated at the Jefferson Davis Clinic without improvement; hypodermic injections of  $1\frac{1}{2}$  c.c. of adrenalin do not check an attack. She was bronchoscopy Sept. 10, 1928, during an interval between the attacks; the tracheal mucous membrane was pale blue. A small amount of tenacious secretion was aspirated; lipiodol was injected and she was Roentgenographed. X-ray shows bronchial and peribronchial infiltrations and somewhat dilated bronchi. For the next ten days she was free of asthma for the first time in several years. She had the next attack on Sept. 20, when we bronchoscopy her during the attack. The bronchial mucous membrane was congested, red and velvety; there was a complete collapse of the trachea during expiration, but not of the bronchi; even during inspiration the tracheal lumen was narrowed, so that the bronchoscope could be advanced only during inspiration, and then with difficulty. The direct application of cocaine and adrenalin to the tracheal mucous membrane did not in the least effect the tracheal collapse: there was hardly any secretion present. She was bronchoscopy again on Oct. 4 in an interval between attacks. When seen last in December, she stated that she still had asthma, but the attacks were not so severe and she considered herself improved.

Mrs. P. E., age 32 years, white. Has been suffering with asthma since the age of nine. Her first attacks followed taking cold. During the last four years the attacks have become very frequent, and last from three days to a week. She has been treated at the Jefferson Davis Clinic since February, 1928. Since August the effect of adrenalin has become of very brief duration, and she requires adrenalin every two or three hours. She was bronchoscopy Oct. 1, 1928; lipiodol was instilled, and she was Roentgenographed. The X-ray shows the bronchi dilated and filled with lipiodol but complete absence of lipiodol in the terminal branches. They may have contained secretion, which did not permit the penetration of the lipiodol.

The bronchial mucous membrane was hyperemic, and a small amount of thick tenacious secretion was aspirated. She was free of asthma for the next six weeks, and she came to the office wheezing, asking for another treatment before her attack became severe. On Nov. 15 she was bronchoscopy during an attack; the bronchi were filled with a thick tenacious, straw-colored secretion, that adhered to the bottom of the tube when the tube was inverted. She was again relieved of wheezing, but she continued to cough. On Nov. 22 she was again bronchoscopy and a quantity of secretion aspirated. During a coughing spell this secretion could be seen welling up from the right middle lobe bronchus, and from the left main stem. She

has had no recurrence so far. She had the flu recently and coughed considerably, but had no asthma.

Mrs. J. W., age 29 years, white. Has had asthma since infancy. She has some attacks during the summer, but during the winter the attacks recur every week and last two to four days at a time. She smokes Kisman's Asthma Remedy and takes ephedrin tablets. For years she has been sleeping upright, propped up on pillows, so that she might breathe easier. She was first bronchoscoped Nov. 1, 1928. Her relief was prompt, and for the first time in years has she been able to sleep in the recumbent position. She was given three treatments, a week apart. When last seen, five weeks after her last treatment, she stated that she had no recurrence.

E. D., age 61 years, white. Was treated for bronchial asthma for the last 15 years. Wheezes nearly all the time, and has bad attacks if he takes cold. Three years ago he had an almost continuous attack of 12 weeks' duration, when he was up nearly every night. He was somewhat improved, after being put on a diet, but still had attacks. When he came to see us, he had been unable to sleep at night for three weeks. He was bronchoscoped on Nov. 9, 1928, at the Methodist Hospital; thick tenacious secretion was aspirated, mainly from the right side; the lower inner wall of the right main bronchus was covered with a grayish-white exudate, and the left bronchus was narrowed in its upper third. The patient developed an acidosis and he vomited for three days afterwards. Since the treatment he has been free of asthma.

A. D. W., age 49 years, white. Developed asthma in September, 1928, following an attack of bronchitis in June. He gets an attack every night, when he coughs, and expectorates a great deal of secretion; the attack always ends with the belching of a quantity of gas. He was bronchoscoped in the Baptist Hospital, Nov. 28, 1928. The trachea and bronchi were pale gray and there was no secretion. He was free of asthma for a week. He went on a deer hunt, stayed out on the road a cold night, and began to wheeze, although he did not have the severe attacks he had before. Dec. 16 he was bronchoscoped again and 10 c.c. of lipiodol was instilled for pneumography. The report was a moderate dilation of the lower right bronchi. The appearance of the bronchial mucous membrane was the same as previously recorded. He had another treatment on Dec. 31. Two days later he contracted influenza, and he wheezed some, but had no bad attacks. He left the city highly pleased with his improvement.

C. P., age 42 years, white. Has had asthma since the age of eight. Has been in Houston eight months, during which time he has been

having attacks continuously. Dec. 2, 1928, he was bronchoscopyed in the Baptist Hospital during an attack. Lipiodol instilled and pneumographed; the mucous membrane of the trachea was swollen, red and velvety in appearance; the swelling obliterated the intracheal spaces; a quantity of thick tenacious secretion was aspirated from both main bronchi. The X-ray report was a dilatation of the smaller bronchi. For the first time in eight months he was free of asthma for 15 days. Dec. 18 he was again bronchoscopyed during an attack; the lungs were so full of secretion that it seemed impossible to aspirate all of it; the secretion was thick and tenacious, so that it adhered to the bottom of the tube when the tube was inverted. Dr. Wood examined the secretion and found diplococci. He was again treated on Dec. 23. Has been free of asthma ever since.

E. H., age 10 years, white. She developed asthma three years ago, three months after having had pneumonia. The attacks gradually became more frequent and for the last two months were almost constant. The mother states that the child was getting 18 hypodermics of adrenalin and atropin in 24 hours. The child was under-nourished and anemic in appearance, but her general examination was reported negative. Sputum was repeatedly examined and was negative for tubercle bacilli. She was bronchoscopyed Nov. 8, 1928, under general anesthesia, and 6 c.c. of lipiodol instilled and the chest X-rayed. A large quantity of mucopurulent secretion was aspirated from the left lower lobe, and some from the right lung. X-ray reported an area of infiltration in the middle portion of the left lower lobe, and a cavity above this. Diagnosis of lung abscess was made. The asthma cleared up, but she continued to expectorate a large quantity of mucus. She was bronchoscopyed again on Nov. 15 and 22 and 28 under local anesthesia, and was given postural drainage. She improved, gained 10 pounds, and she left the hospital on Nov. 30; had another attack that night, after traveling 30 miles into the country, in a severe storm. She returned to the hospital two days later. She was bronchoscopyed Dec. 6; this time the mucous membrane of trachea and bronchi was red, congested and swollen; there was considerable secretion, but not as profuse as in the first examination. Bronchoscopyed Dec. 12, 1928. She left the hospital Dec. 15; has been free of asthma since.

#### CONCLUSION.

Just what is the mechanism by which bronchoscopic aspiration gives relief, the degree of its permanency, and why relief is obtained in one case and not in another—are problems still to be solved by

further study. Our limited experience would give any hypotheses we might set forth a purely speculative aspect. It is possible that long-standing asthma sets up local changes in the bronchial mucosa, and the aspiration of irritating secretions breaks up the etiology-complex which excites an attack. We have not touched at all on the etiology of asthma because we feel that with that phase the bronchoscopist has no concern. Bronchoscopic examination is not advised as a promiscuous procedure or as cure-all to be employed in every case of asthma. If the internist can determine a definite cause for a given case, such as infections of the upper respiratory tract or an allergy, and can relieve the case by treatment, bronchoscopy is not indicated. In those cases in which the etiology remains uncertain, or the case does not respond to what appears rational treatment, a diagnostic bronchoscopy may reveal hitherto unsuspected changes in the bronchi, and aspiration of secretions may give the patient relief not otherwise obtained. In spite of the limited experience, we feel justified in concluding that in a persistent case of asthma, in which a physician has exhausted all the means at his command toward arriving at a correct diagnosis and giving the patient relief, bronchoscopic investigation is indicated.\*

1117-19 Medical Arts Building.

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\*At the time of publication, May 7th, 1929, an added report of the present condition of the seven cases is as follows: Case 1, no change; Case 2, no recurrence; Case 3, lost track of; Case 4, no recurrence; Case 5, lost track of; Case 6, no recurrence; Case 7, had a recurrence lately.

## BRONCHOSCOPY AND ESOPHAGOSCOPY IN INFANCY.

DR. ALBERT J. GUERINOT, Pittsburgh.

The infrequency of bronchoscopic or esophageal instrumentation in extremely young infants leads me to narrate the following two cases.

H. W., female, age 2½ months. Referred by Dr. George Leibold, of this city, in March, 1925, with a history of having swallowed an open safety pin 48 hours previously. Radiograph made and pin located in upper one-third of esophagus, point up. Removed with an esophageal speculum, infant's size, and pin forceps. Time 2½ minutes, no anesthetic, no complications.

Baby W., age 4 days, was seen in consultation with Dr. W. G. Aughenbaugh, of this city, Jan. 12, 1928. Called to home of parents by this physician, as both parents and baby were found unconscious, due to having been poisoned by carbon monoxide gas.

The father responded to artificial respiration, and mother was treated with a pulmometer. I introduced into the trachea of the baby a 4 m.m. bronchoscope, using oxygen directly into the lungs. Time of treatment about 25 minutes. The child made an uneventful recovery, with no complications.

My main object in calling attention to the general profession is to the more frequent use of oxygen directly into the trachea. There is not a day goes by without my reading in the newspapers numerous cases of gas poisoning throughout the entire country, invariably accompanied by death. I fully believe that a great number of these fatalities could be averted by more frequent use of the bronchoscope with the direct introduction of oxygen into the lungs, perhaps in conjunction with carbon dioxide gas, 95 per cent oxygen and 5 per cent carbon dioxide.

604 Westinghouse Building.

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Editor's Note: This ms. received in The Laryngoscope Office and accepted for publication Feb. 19, 1929.

## A STUDY OF POST-TONSILLECTOMIZED INDIVIDUALS.\*†

DR. ARTHUR J. WAGERS, Philadelphia.

The decision to remove the tonsils in the cases coming to the clinic of a large hospital is often based upon the most superficial examination and study of the patient. This is not due to the fact that tonsillectomy is regarded as a certain recommendation in any patient who has not already submitted to operation one or more times, but because of the time required to make complete original examinations which take into consideration past illnesses and their possible relation to conditions of disease now present. In the usual routine of most clinics with which I am familiar, but little if any attempt is made to learn from the patient himself whether or not he has found the removal of his tonsils a benefit to his health.

In the present study it has been my particular concern to ascertain the patient's viewpoint after a period of time, varying from 12 to 18 months following operation.

### PRE-OPERATIVE STUDY.

A record form was prepared and filled out completely for each case examined.

The information recorded consisted of the patient's name and address, age, weight, occupation, by whom referred to the clinic, and for what reason. Then followed a list under the heading, "Previous Disease", which included: measles, chickenpox, whooping cough, mumps, scarlet fever, diphtheria, smallpox, bronchitis, rheumatism, pyorrhea, pleurisy, croup, pneumonia, typhoid, tonsillitis, quinsy, retropharyngeal abscess, suppurative otitis media, chora, adenitis, infantile paralysis, eczema and anemia. Each of these was checked according to the history given and additional illness of importance noted.

Next followed "Present Or Repeated Conditions", which served as indications for tonsillectomy.

These conditions were: Mouth breathing, repeated attacks of pharyngitis (sore throat), frequent "head colds", repeated attacks of follicular tonsillitis, past quinsies, cervical adenitis, rheumatism, aural discharge, excessive fatigue, headache, snoring, restlessness, under-

\*Read before the Philadelphia Laryngological Society, Feb. 5, 1929.

†From the Laryngological Department of the Graduate School of the University of Pennsylvania.

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development, inattention, poor work in school, imperfect speech, impaired hearing and, finally, the examination of the tonsils themselves, noting infection of tonsils and hypertrophy of tonsil and adenoid tissue.

It must not be assumed that all these conditions result from the presence of pathological tonsils—there may be other factors or pathological conditions present in the body and these should be located and receive appropriate treatment. Mouth breathing is usually the result of obstruction in upper air passages caused by enlarged pharyngeal and faucial tonsils, and it follows that removal of these hypertrophies relieves the mouth breathing. Tonsils which have once been attacked by acute inflammation of the follicles are prone to subsequent attacks, so that in time the tonsil tissue shows evidence of chronic infection and this local condition, resulting in absorption of toxins, is, in large measure, responsible for frequent "head colds", rheumatism, excessive fatigue, headache and, in the case of school children, restlessness, inattention and poor work in school. Chronic otorrhea and impairment of hearing are conditions which, to my mind, are only very indirectly affected by the presence of infected tonsils. In some instances their removal may be helpful in restoring the ears to normal, but I believe it is a mistake to tell patients nothing can be done for their ears until the tonsils have been removed. Too many patients have been led to believe that by submitting to tonsillectomy their ears would cease discharging or tinnitus aurium would disappear and their hearing would be restored. Their faith in the infallibility of surgery and surgeons is terribly shaken when so often they not only experience no relief from the ear condition but find it actually going from bad to worse.

The cases in this particular series number 274 of all ages, from 2 to 60 years. They have been divided arbitrarily into three age groups—the first group of 143 includes all those under 11 years. The second group, numbering 90, includes those from 11 to 25, and the third group all above 25 years of age, numbering 41 cases. At whose suggestion did these patients come to the Nose and Throat Clinic? In answering this question no note is taken of age groups. Other departments in the hospital referred 42, 63 were sent by the family physician, 69 came of their own accord or were sent by the parents. Other hospitals sent 20. Friends or neighbors were responsible for 23. School doctors and nurses referred 33, and charitable organizations brought 10.

For what reason did these patients come? In the case of those coming from other hospitals and other departments of the same hos-

pital, they usually brought a request for examination of throat and advice—such requests came with 96. There were 76 direct requests for tonsillectomy, these coming mainly from family physicians and school physicians or nurses.

It is of special interest to note that when the question was asked, "Why have you come to the clinic?" 57 patients made the all-comprehensive reply, "Tonsils". In the minds of these patients the sum total of all their ailments was expressed in the one word, "tonsils", and the immediate purpose of their visit was to have the offending tonsils removed. The routine examination was made and in nearly every instance operation was decided upon. Among other reasons given for seeking advice were hoarseness, backache, fatigue, rheumatism, epistaxis, defective speech and ear conditions. In taking up the histories of previous disease and present conditions, only summaries will be given, as it seems unnecessary to present the individual cases.

Taking the first age grouping of 143 patients under 11 years of age, the previous diseases are given in the order of frequency. Measles 95, tonsillitis 82, cervical adenitis 77, whooping cough 63, chickenpox 47, suppurative otitis media 41, bronchitis 40, pneumonia 28, mumps 24, croup 19, diphtheria 14, scarlet fever 10, chorea 7, rheumatism 5, pleurisy 4, typhoid fever 3, retropharyngeal abscess 3, pyorrhea, quinsy and anemia each 2, infantile paralysis and eczema each 1. In these early years of life it will be noted that aside from the usual childhood diseases—measles, chickenpox, whooping cough and mumps—the diseases occurring most often were infections involving the throat, middle ear, bronchial system and cervical glands. Summarizing the "present conditions" or complaints made at time of examination, we found the tonsils hypertrophied in 137 cases, evidence of tonsillar infection in 129, mouth breathing in 107, occasional sore throat in 101, "head colds" in 99, cervical adenitis in 98, snoring in 73, history of one or more attacks of acute follicular tonsillitis in 64, restlessness in 64, excessive fatigue in 34, headache in 29, inattention at school or at home noted in 22, under-development in 21, imperfect speech in 15, aural discharge in 14, poor work in school in 9 cases, rheumatism in 7, impaired hearing in 6 and past quinsies in 3.

In the second group, comprising 90 cases between 10 and 26 years of age, "previous diseases" were noted as follows:

Measles 67, one or more attacks of tonsillitis in 63, cervical adenitis 43, whooping cough 41, chickenpox 29, mumps 27, rheumatism 16, bronchitis 14, croup 12, scarlet fever 12, pyorrhea 10, diphtheria 9, suppurative otitis media 9, pleurisy and typhoid fever each 7, pneumonia 6, chorea and eczema each 5, quinsy 3 and smallpox 2.

The "present conditions" found in this group included: infected tonsils 89, hypertrophied tonsils 82, repeated attacks of sore throat in 77, head colds 65, one or more attacks of acute follicular tonsillitis 63, headache 55, cervical adenitis 51, excessive fatigue 39, mouth breathing 31, snoring and restlessness each 21, rheumatism 17, inattention 11, poor work in school 7, under-development 6, aural discharge and impaired hearing each 5, imperfect speech and past history of quinsy 3 cases each.

In this group we note especially an increase in the proportion of cases which have suffered from attacks of follicular tonsillitis, fatigue, headache and rheumatism.

Of the final group, comprising 41 persons whose age was above 25 years, 36 had had acute attacks of tonsillitis, measles in 28 cases, rheumatism in 23, pyorrhea in 22, whooping cough and mumps in 15, cervical adenitis in 14, chickenpox in 13, bronchitis and quinsy in 9, croup in 7, pleurisy and typhoid in 5, scarlet fever and diphtheria in 4, pneumonia in 3, lues, suppurative otitis media and eczema 2 each, and one case each of smallpox, endocarditis, myocarditis and anemia.

The tonsils in each member of this group were chronically infected. Thirty-one were subject to attacks of acute tonsillitis; sore throat or pharyngitis in 37, excessive fatigue 29, "head colds" and headache in 24, rheumatism 22, cervical adenitis 18, snoring 11, past quinsies in 10 cases, restlessness in 9, impaired hearing 5, and under-development in one. In this group there were no cases of aural discharge at time of examination. We have here a higher proportion of cases presenting evidences of infected tonsils. The same is true for rheumatism. From this study it appears that the individual is much more likely to suffer from quinsy after the age of 25 than before.

#### OPERATION.

The above observations having been made and recorded, these 274 cases underwent operation for removal of tonsils. Operations were performed by members of the staff and by graduate students under supervision. Ether anesthesia was used in the majority of cases but many of the adults had local anesthesia. The methods of operation were mainly eversion and snare, dissection and snare, and enucleation by means of the La Force instrument. It is not the purpose of this study to consider methods, technique or immediate operative results. We are only interested in the ultimate results of operation as performed in these cases.

*Results of operation as viewed by the patients themselves or by the parents of children:* At the time of the first examination of these

patients, it was explained that in order to complete our record, a letter would be sent each of them a year or more after operation, requesting a return visit for re-examination. The idea was received with enthusiasm. Almost without exception, they gladly promised to co-operate. In due time letters were sent reminding these patients of their operation and requesting the return visit which they had promised. The letter also included a questionnaire covering the conditions found at time of first examination, and it was requested that in case it was impossible to visit the clinic, they reply to questions enclosed. They were also asked to state what illness, if any, they had had since operation. Also whether or not they felt they had been benefited by the operation. To relieve them of all inconvenience possible, a stamped, addressed envelope was enclosed for reply.

The results of this appeal were as follows: 40 letters were returned as not deliverable; 42 reported by answering the questions in the letter sent them; 42 returned for personal examination; 150, who evidently received the letter, ignored the summons entirely.

It is, therefore, disappointing to be able to give a summary of the post-operative experience of but 84 cases out of the 274 studied before operation.

From the first group—those under 11 years of age—we had 46 reports on conditions following operation.

Twenty had been free from sickness during the year or more following operation. Twenty-six reported disturbances of rather minor importance, mainly measles, whooping cough and "head colds". In answer to the question, "Do you find that the operation has proved beneficial to the child's health?" the parents of 39 reported definite improvement, while seven could see no improvement. It is not to be presumed that all the conditions of disease found at original examination had been eradicated in every child reported as improved. It is not necessary to give the details of individual cases. It is enough to know that the parents of 39 out of 46 felt the operation had been well worth while.

We have 23 responses in the group aged 11 to 25. Twelve of these had not been ill since the operation, 11 had been ill at some time and from more serious complaints than those suffered by the younger group. Pneumonia, bronchitis, grippe and rheumatism being the more frequent complaints. As to the general improvement resulting from operation, 14 expressed themselves as definitely improved, while nine failed to note betterment of their general health.

Mention might be made of one of these individuals who observed no improvement. A married woman, age 24 years, came to the clinic

of her own accord to have her tonsils examined. She mentioned only measles, rheumatism and tonsillitis as "past illnesses". At the time of the examination she complained of mouth breathing, repeated attacks of tonsillitis, frequent "head colds", rheumatism, very excessive fatigue, headache, restlessness and inattention. She stated that she had been very nervous since a pelvic operation performed a year previously. Her tonsils were hypertrophied and showed evidence of chronic infection. Clearly, here was a case to be benefited by removal of the infected tonsils, which was done. And yet when she returned one year later she reported improvement in mouth breathing only. She had suffered from sore throat all winter following the operation, had been subject to frequent head colds, and still suffered from rheumatism, fatigue, headache, restlessness, and during the past month had experienced a steady, sharp pain in the cardiac region, accompanied by shortness of breath. Evidently the tonsils were not the only source of trouble in this case and she was advised to visit the Medical Clinic for further examination. I may add that all cases not showing satisfactory improvement at time of re-examination were referred to other services appropriate to conditions then exhibited.

In our final group—those above 25 years of age—we have 15 re-examinations out of an original 41. There had been no post-operative illness in five of these, while 10 had suffered from various ailments, "congestion of lung", "attacks of indigestion", "influenza", "rheumatism", "kidney disease", "backache", "colds" and "sore throat" being the conditions complained of.

Answering the direct question, 10 admitted improvement from operation, while five did not.

It is noted with some satisfaction that the majority were benefited, but this study also serves to impress on us the fact that the tonsils are not alone responsible for all the suffering to which human flesh is heir.

#### CONCLUDING SUMMARY.

Original examinations were made of 274 cases.

Subsequent interviews or reports were obtained in 84 cases.

No illness within one year or longer following operation reported by 37.

Illness of some description reported by 47

Definitely improved by operation, 63.

Not improved by operation, 21.

13th and Spruce Street.

## International Digest of Current Otolaryngology.

### *Editor:*

DR. MAXWELL FINEBERG, St. Louis.

### *Collaborators:*

Priv. Doz. Dr. J. Berberich, Frankfurt a/M.

Mr. W. S. Daggett, London.

Priv. Doz. Dr. G. Keleman, Budapest.

Dr. D. E. Staunton Wishart, Toronto.

St. Louis Jewish Hospital E.N.T. Journal Club.

A rather good example of how careful one must be in evaluating current literature is shown by two articles appearing almost simultaneously, each being a complete denial of the other.

In the February, 1929, Archives of Otolaryngology, Schwartz, of New York, reports extremely successful results in the treatment of acute otitis media by use of suction. He is very enthusiastic about the procedure and explains his technique. From this article alone, a reader might be inclined to use suction at the onset of every acute otitis media and expect to have only uniformly remarkable results.

The other article is by Scal, of New York, in the March, 1929, Archives of Otolaryngology. Scal claims that while suction may temporarily alleviate the acute symptoms, he finds that the pathology produced is invariably the same, *i. e.*, that nature has performed a partial mastoidectomy. Scal claims that suction not only has a poor effect on the acute otitis but that it also leads to a mastoiditis which is very often associated with an intracranial complication. He reports four cases which he calls "suction mastoiditis". His final conclusion is that suction should never be applied to the ears. M. F.

Prof. E. Glas, of Vienna, at a recent seminar meeting of the Vienna Medical College, suggested the use of tuning forks in differential diagnosis of nasal sinus disease. He contends that, if the ears are normal, the Weber test will be localized to the side of the diseased sinus. The chief use of this test is to rule out migraine or neuralgic pain. M. F.

Prof. H. Finkelstein, the eminent Berlin pediatrician, in Jahrest. f.a. Forth, June, 1928, comments on the occurrence of suppurative sinusitis and otitis in infants. He says that ethmoid involvement is the commonest sinus condition under three years of age and very often is associated with a mild, livid edema of the upper lid. The disease runs a mild course and usually clears up with the associated

rhinitis. When the condition becomes chronic, tonsillectomy and adenoidectomy are imperative to effect a cure. In his discussion of otitis media in infants, Prof. Finkelstein says that gastro-intestinal symptoms play a big part in the diagnosis. When he sees an acute otitis media, with gastro-intestinal disturbance and a sinking of the posterior superior wall of the external auditory meatus, he advises antrotomy. Finkelstein claims that in influenzal otitis early myringotomy is of no special value except for alleviation of pain. In a series of controlled cases he saw no difference between cases which broke spontaneously and those that had early paracentesis. M. F.

Kallarits, of Budapest, in Schweizer Med. Woch., No. 40, for 1928, reports his treatment of ozena. He uses hot 2 per cent NACL solution as a nasal cleanser. The solution is used in irrigation and sniffing; then a tampon soaked in this solution is inserted in nose for a few moments. When the tampon is withdrawn, the crusts usually come with it. This treatment soon deodorizes and the patient feels well as long as treatment is continued but no cure is claimed; this treatment must be continued through life. M. F.

Sellei, of Budapest, in the Deutsche Med. Woch., No. 42, 1928, suggests that annoying smarting of the tongue is very often due to hyperacidity and that alkalis are beneficial in relieving the symptoms. The condition is frequently found as an early symptom of pernicious anemia. M. F.

Turnbull, of Los Angeles, in the March, 1929, Archives of Otolaryngology, describes an antro-ethmophenoinal operation which cleans out the sinuses without destruction of the nasal parts. His operation is an augmented Caldwell-Luc, which drains not only the antrum but also the frontals, ethmoids and sphenoid on that side. The operation retains the turbinate bodies intact and is carried out under direct vision. To be able to reach the ethmoids and sphenoid is an advantage over the endonasal route. The operation is done under local anesthesia and the author claims that the teeth are never devitalized by his initial incision. M. F.

The Colorado Ophthalmological and Otolaryngological Societies announce their annual Congress and Summer Graduate Course, to be held this year from June 17 to 29, inclusive. Many nationally known men have been invited to give special courses. For further information write Dr. H. L. Whitaker, Secretary-Treasurer, Republic Building, Denver, Colo.

The American Laryngological, Rhinological and Otological Society announces that the Annual Meeting will be held in San Francisco, July 4-5, with headquarters at the Fairmont Hotel. Arrangements have been made with railroads for special facilities. A special train will stop over on July 2, at Salt Lake City, allowing an opportunity for attendance at the meeting of the Pacific Coast Oto-Ophthalmological Society. The meeting is also timed so as to allow those so desiring to attend the meeting of the American Bronchoscopic Society in San Francisco, July 6, and the meeting of the American Medical Association, in Portland, Ore., July 8-12. Dr. Robert L. Loughran, 33 East 63rd Street, New York, N. Y., is secretary of the American L., R. and O. Society.

The Fifty-First Annual Meeting of the American Laryngological Association will be held at the Hotel Shelburne, Atlantic City, May 20-22, 1929. The meeting will close at noon on Wednesday, May 22, and will be followed immediately by the meeting of the American Otological Society, which will last through May 24. Interesting programs have been arranged for these meetings and those anticipating being present should lose no time in making reservations.

Sir St. Clair Thomson, of London, for many years a collaborator of *THE LARYNGOSCOPE*, has just been elected Correspondent étranger de l'Académie de Médecine.

Dr. Chevalier Jackson announces his annual Paris course in conjunction with Dr. Fernand LeMaitre, June 3-21, inclusive. Two separate courses will be given, the first consisting of five sessions and for which no fee is charged; the second will be given from June 3 to 21 and is limited to twelve registrants. For further information apply to the Secretary, Melle Jeanne Gobréau, 120 Avenue Victor Hugo, Paris (16e), France.

We are informed that there will be a Post-Graduate Course in Ear, Nose and Throat surgery for American physicians at the University of Bordeaux, France, commencing July 22, 1929, and continuing for five weeks, under the direction of Dr. Georges Portmann. Dr. Leon Felderman, of Philadelphia, is in charge of registering the American physicians for this course.

Dr. Franz Hasslinger, of Vienna, is receiving a very warm welcome while in the United States. His courses in the various cities have been nicely received and he is conveying to many otolaryngolo-

gists a very appreciative idea of what the Viennese School is capable of in the teaching line. Dr. Hasslinger has already held courses in five or six American cities and before sailing for home, some time about the middle of June, his tentative plans are to visit Dallas, Kansas City, St. Paul, Milwaukee, Detroit, Cincinnati and New York. His leave of absence from the University of Vienna expires July 1, and, time permitting, courses are being arranged in these various cities.

The equipment which Dr. Hasslinger has devised for teaching purposes is indeed unique. His "phantom" larynx with its electric bell has previously been described. A newer piece of machinery for practice in endoscopy consists of a human body which reminds one of the electrical robot. All anatomical details are perfectly constructed and to make the practice procedure of passing the various tubes as nearly similar to human circumstances as possible, there is a mechanically driven heart and diaphragm.

Apart from meeting many old friends, Dr. Hasslinger has made many new ones on this side of the water. We hope the balance of his sojourn will be as pleasant and as auspicious as its start.

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GOSTE DOHLMAN, of Upsala, has published a little supplementary to the *Acta Otolaryngologica*, concerning Experimental Research of the Galvanic Vestibular Reaction. His conclusions are: (1) That the Galvanic reaction has no bearing on the interpretation of the function ability of the peripheral labyrinth or of its sense epithelium; (2) The Galvanic reaction centers around the vestibular ganglion and shows the capacity of function of the ganglion cells; (3) After bilateral labyrinthine extirpation one can, by unilateral stimulation of the vestibular ganglion, once more bring out labyrinthine symptoms. This proves that the ganglion is a certain "tonus" which is very closely connected to the labyrinthine organ; (4) Through trauma in the vestibular nucleus (in rabbits), changes are brought about in the tonic reflexes of the eye and change or complete loss of the labyrinthine Galvanic reaction is to be obtained.

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Dr. Joseph Beck, of Chicago, is scheduled to conduct a course on Pathology of the Ear, Nose and Throat, in Kansas City, June 13-15, 1929. The course will be given under the auspices of the Kansas City Eye, Ear, Nose and Throat Society. Those desiring to take this course please notify the secretary of that society, Dr. A. E. Eubank, 636 Argyle Building, Kansas City, Mo.

## THE NEW YORK ACADEMY OF MEDICINE.

### SECTION OF LARYNGOLOGY AND RHINOLOGY.

December 26, 1928.

DR. WOLFF FREUDENTHAL: I did not expect to be called upon to make a speech, but I am very much gratified at being made your Honorary Chairman on this occasion and I assure you that it means much more to me than you may appreciate. When a man reaches my age such courtesies are deeply felt, and I thank you from the bottom of my heart.

My experience in the Section goes back some 43 years. I studied on the other side and graduated with Killian at Freiburg on July 4, 1884. I arrived in New York on Thanksgiving Day in 1885, and ought to be considered a 100 per cent American. After my graduation I went to the University of Berlin. There I never saw an operation on the antrum; to probe a sinus *in vivo* would have been considered criminal in those days.

I remember very well the first time I attended a meeting of the Academy. One man got up and spoke about pneumonia, and I had no idea what pneumonia was; later on I asked him: What is this pneumonia, and I still could not understand, and finally he wrote it down and at last I understood that it was pneumonia. The English pronunciation of Greek words was hard for me. The first meeting of the Section of Laryngology was a very important one. The subject was something new that had just been discovered; they called it adenoids. It was a big meeting, held at Thirty-second street, and several speakers mentioned how much benefit could be derived by treatment, etc. Finally one man said: "The people in Denmark, or Russia, or Germany may have adenoids but the Anglo-Saxon race has not got them". It may be that in 10 years from now people will say that Anglo-Saxons have no "sinuses". I wish this might prove true.

I have attended this Section these many years and it has always been one of the best Sections of the Academy. Whether the meetings were a success or not depended entirely on the energy, enthusiasm and perseverance of the Chairman. Things looked different when I was Chairman in 1908. Occasionally I had a hard time to fill up the hour, but there were not so many laryngologists then as now. We never dreamed then of having a pre-meeting banquet as we have now, and I think that much credit is due to your present Chairman, Dr. Jones, for the excellent meetings and programmes we are now having.

Again, I thank you.

**Pathological Lesions of the Frontal Sinus.** (a) *Osteoma of Frontal Sinus*; (b) *Frontal Lobe Abscess*; (c) *Osteomyelitis of Frontal Bone*; (d) *Frontal Sinusitis With Epidural Abscess*. Dr. R. T. Atkins.

(To appear in a subsequent issue of THE LARYNGOSCOPE.)

#### DISCUSSION.

DR. J. E. J. KING: All of these cases shown by Dr. Atkins have indeed been very interesting. I had an occasion to operate upon osteoma of the frontal sinus in 1919 and it was almost a duplicate in every respect of Dr. Atkins' case. There was, however, a subcutaneous pocket of pus and also an extradural abscess beneath the osteoma which necessitated wide open drainage.

I wish to congratulate Dr. Atkins upon his splendid results in dealing with brain abscesses, especially in view of the high temperature present, which I think he stated was 104°. These cases usually do not do well. Cases which usually recover are those in which the temperature is either normal or 99.5°, 100° or 100.5°. Of all cases of brain abscess, I think the temporosphenoidal type, especially when encapsulated, is the most likely one to recover, with

complete return of function. For some reason they do not have Jacksonian attacks. This complication is more likely to follow frontal lobe abscess. Frontal lobe abscesses give the second best result, and the cerebellar type is the least likely to get well. From the standpoint of the organism producing the infection, that abscess due to the streptococcus is more likely to recover. The next is that due to the staphylococcus, and the least likely to recover is that abscess caused by the pneumococcus. This is just the reverse usually of infections in other parts of the body. I would like to ask Dr. Atkins how long he allows the drainage tube to remain in position and the manner in which he removes it, whether he removes it completely at one time and substitutes another drain, or whether the tube is gradually removed. It is difficult to understand how this type of drain can be used without having a secondary abscess or pocket develop sometimes.

DR. C. J. IMPERATORI: My remarks will apply principally to the brain cases, inasmuch as I have had some experience with such cases, and for the sake of brevity I will show upon the screen two slides giving the results of my observations in tabulated form. The first is a summary of the prominent symptoms derived from an analysis of five cases in which brain abscesses were found complicating frontal sinus disease:

1. Headache, especially at night and localized to the side in which the abscess was found. This should be considered the cardinal symptom, and particularly so in young people with sinus disease or those on whom some nasal operation has recently been done.
2. Mental condition: Euphoric state; that is, a jocose, flippant and discordant emotional reaction of well being that is out of proportion to the apparent seriousness of the patient's illness; confusions of thought and mild delirium, loquacity, amnesia episodes.
3. Convulsions that were of the Jacksonian type and on the side opposite to the lesion.
4. Occasional vomiting.
5. Chemosis and some eye ground changes. Rarely more than to two diopters of inflammatory process. The engorgement of the retinal veins on the nasal side has been observed. Papilloedema has not been noted. Optic neuritis when the abscess is localized.
6. The abdominal reflexes are disturbed on the side opposite to the lesion. When meningitis ensues, the abdominal reflexes are diminished on both sides. Ataxia and disturbance of station is present when the lesion encroaches on the frontoparietal region. When the lesion encroaches on the post-central convolution convolution of this area, the disturbance noted is chiefly in disabilities connected with the recognition of size and shape of objects; also the inability to discriminate between one and two points, which are promptly recognized by the normal individual at 3 m.m. or less. Other neurological findings, such as exaggerated knee jerk and ankle clonus, are usually found.
7. High temperature toward morning and associated with the headaches.
8. Pulse rate usually in relation to the temperature, and in no case was it noted to be low.
9. Spinal fluid usually with high cell count and no bacteria; leukocytes usually above 15,000.

The next slide presents suggested observations on patients having or suspected of having a frontal lobe abscess associated with frontal sinus disease:

1. Determination of the olfactory function.
2. Estimation of loss of weight.
3. Determination of change of temperament of the patient and existence of a state of euphoria.
4. Relationship of headaches to the side of the lesion—if any abscess is found.
5. Relationship of the degree of choked disc to the clinical signs of meningitis and the laboratory findings of the spinal fluid.

6. The pre-determination of whether the patient's condition may be classified as to the stages of the formation of the abscess during the clinical course of the disease; that is, onset, remission, manifest and terminal stages.

7. At the time of operation on the frontal sinus and in those patients with a suspected frontal sinus abscess and in whom the inner table is found exposed, excessive intracranial pressure should be noted.

8. The proper liaison between the neurologist and otolaryngologist.

**Prognosis.** In general, the prognosis is better the longer one waits before operation and thus permitting a walling-off of the abscess cavity. There is rarely an urgency in diagnosing brain abscess, and one should be cautious in localizing lesions, especially so when dealing with conditions in the frontal lobe. I have always been of the opinion that the neurologist should be given time to localize the abscess, thus permitting nature to encapsulate it.

**DR. ATKINS:** With this particular frontal lobe abscess we used a rubber tube drain, and it gradually pushed itself out; as it came to the surface, that was the end of it. With the other abscesses that I have had in the past, I have used the Mosher basket drain; in the last two cases, which recovered, the drain remained in place about a month in one, and I think almost two months in the other.

**Cyst of the Ethmoid Region.** Dr. G. F. Oberrender.

*(Appears in full in this issue.)*

**Two Cases of Thyrotomy.** Dr. J. D. Kernan.

*(Appears in full in this issue.)*

DISCUSSION.

**DR. H. H. FORBES:** Dr. Kernan's treatment of the case as he outlined it on the blackboard was very ingenious. I had an opportunity of seeing a similar case a short time ago and was puzzled to know what to do for it. The patient is 21 years of age now, and I shall try this method on him. I congratulate Dr. Kernan and the patient.

**DR. FRANCIS W. WHITE:** I, too, congratulate Dr. Kernan on his results and demonstration. The diagram was very interesting. All of us could make suggestions, but I know Dr. Kernan has already considered all of them.

**A Case of Laryngectomy.** Dr. J. W. Babcock.

*(Appears in full in this issue.)*

DISCUSSION.

**DR. J. M. LORE:** We had a case with Dr. Stewart (a growth in the external auditory canal), in which the first biopsy was granuloma, then epithelioma; operation was advised and accepted by the patient, and after the last operation the report came back, sarcoma. Here you have granuloma, epithelioma and sarcoma.

**DR. C. J. IMPERATORI:** It is refreshing to hear such a case report as Dr. Babcock has given, and his frank acknowledgment of the possible failure in not having made the correct diagnosis and apparently not having done the correct operation; but in this particular case it was exactly the right thing to do—even though eventually the report was that of a nonmalignant growth. These are the kind of cases that we learn most from. We learn more by our mistakes than by our successes. I congratulate Dr. Babcock on his presentation.

**DR. L. I. GLUSHAK:** Referring to the speech in this case, I do not see why attempts are not made to teach these laryngectomized patients to speak, as is done in the clinics of phonation abroad. These people are taught to swallow air and bring it into the pharynx, which contracts, producing low tones.

I saw a laryngectomized woman abroad who spoke so distinctly that had she not taken off her neck ribbon and showed me the tracheal tube I would not have believed she had no larynx. The voice training in such cases here should be taken into serious consideration.

DR. BARCOCK (closing): I have nothing to add. I have had an exactly opposite experience in getting a negative laboratory report and finding extensive carcinoma in the lesion. I was going to do a thyrotomy and excision of what looked like a non-malignant tumor, of which two negative biopsies had been made. The mass seen was normal tissue bulged out over an extensive cancer, almost filling the larynx and quite impossible to completely excise.

**Report of a Case of Dysphonia Spastica.** Dr. Leopold Glushak.

I present tonight a young woman who came to me a week ago at the Post-Graduate Dispensary with a history of having an abnormal voice for a year-and-a-half. When she attempt to speak she gives a high screech and becomes unable to continue further phonation. You immediately realize on observing her that the screech is the result of spasm of the glottis. Laryngoscopically, everything is normal and on attempting to phonate the cords fall into a spastic state and remain that way, not being able to relax so as to allow vibration and production of tone. The spasm occurs not only in the glottis, but in the soft palate, diaphragm and all other respiratory muscles. She can, however, produce a falsetto tone. This is not a condition of hysterical aphonia, which is an asthenic condition the contrast to this case, which is a spastic state of the entire vocal and respiratory apparatus.

**Relationship of Polypoid Ethmoiditis to Asthma.** Dr. J. M. Loré.

(To appear in a subsequent issue of THE LARYNGOSCOPE.)

**Demonstration of Intratracheal Anesthesia and a New Method of Resuscitation.** Dr. Paluel J. Flagg.

(To appear in a subsequent issue of THE LARYNGOSCOPE.)

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JOINT MEETING OF THE SECTION ON OTOLOGY AND THE SECTION ON NEUROLOGY  
AND PSYCHIATRY.

Jan. 11, 1929.

**Diagnosis of Brain Abscess.** Dr. Foster Kennedy.

(Appears in full in this issue.)

**Treatment of Otological Brain Abscess.** Dr. Harry P. Cahill (by invitation).

(To appear in a subsequent issue of THE LARYNGOSCOPE.)

**Neuro-Surgical Treatment of Brain Abscess.** Dr. Joseph E. J. King.

(To appear in a subsequent issue of THE LARYNGOSCOPE.)

DISCUSSION.

DR. J. W. STEPHENSON: I have recently read an interesting abstract, and the suggestion there in implied I give to you for your consideration. The writer based the time for surgical intervention in brain abscesses upon the behavior of the papilloedema. His contention was that in the presence of progressive choking, surgery was not indicated, in that the progression was significant of spreading infection and no encapsulation, and it was his belief that intervention at this time would tend to further spread the infection. If the choking became stationary or regressive, it was indicative of encapsulation and for this reason warranted intervention. The idea sounds plausible to me. One reason why we do not get more uniform success in brain operations is because we have not as yet arrived at that differential finesse when we can say with reasonable certainty what is and what is not operable. I believe that time will come; and Dr. King's remarks in regard to cerebellar abscess is a step in this direction.

DR. EDWARD B. DENCH: It is a great pleasure always to speak at any meeting where our distinguished Boston friend presents a paper, because he does it with such modesty and yet with such great force and convincing arguments that when it comes to opening the discussion the speaker has very little to note.

Brain abscess as the topic for discussion tonight may lead us to a consideration of how common a condition it is. I have looked over the statistics of the New York Eye and Ear Infirmary for the last seven years. In that time we saw 94,469 ear cases, and out of these we found only 11 cases of brain abscess. Of course the total number of ear cases which came in included all conditions, from the most simple to the most grave; from impacted cerumen or furunculosis to severe intracranial complications, and yet the fact remains that out of 94,469 cases brain abscess occurred in only 11 patients. Personally, I am inclined to believe that this proportion may be larger than the actual fact, because in our hospital reports the cases mentioned were simply recorded as having been operated on for brain abscess. We know nothing about the autopsy report in the fatal cases of this series, neither do we know the number of cases which recovered. Certainly, a certain number of these fatal cases may have been suffering from otitic meningitis or cerebritis. I only mention this fact to show the infrequent occurrence of brain abscess in a very large number of aural cases.

Now, contrast these statistics with another series of cases which I analyzed several years ago. There were 10,000 or 15,000 cases of acute or chronic middle ear suppuration and of this series, 85 had some intracranial complication: brain abscess, sinus thrombosis, meningitis or extradural abscess, so that while a fairly large series of cases suffering from suppurative middle ear lesions will show over 1 per cent of intracranial complications, the incidence of brain abscess out of a very large number of ear cases examined is extremely rare. My own experience in brain abscess consists of 27 cases operated on, either by myself or a member of my staff. Most of the cases were operated on by myself. Of these 27 cases of brain abscess, 21 were cerebral abscesses, and six were cerebellar abscesses. Of the cerebral abscesses, nine were cured and 12 died. I saw one of the first patients I operated on, not so many months ago walking around the infirmary and gesticulating in the same manner as when he came into the hospital some 30 years ago, and he was as hail and hearty as ever, despite the fact that he had had a large abscess in the temporosphenoidal lobe. Of the cerebellar abscesses, there were six cases, of which four died and two were cured. Now, contrast these statistics with those reported by MacEwen in his work on "Pyogenic Diseases of the Brain and Spinal Cord", 1893. He reported 19 cerebral abscesses, with 18 recoveries and one death, showing a very low death rate. It should be remembered, however, that all of MacEwen's cases were not of otitic origin. Naturally traumatic cases present an entirely different aspect than those of otitic origin. All of those presented by myself were of otitic origin. Körner in his work reports 55 cases of cerebral abscess, with 29 recoveries and 26 deaths. This represents the average mortality in otitic brain abscesses.

In 1907 I went into the subject of cerebral and cerebellar abscesses rather thoroughly, and in the Transactions of the American Otological Society of that year I collated, and reported on, 100 cases of cerebral abscess, of which 52 were cured and 48 died.

Regarding cerebellar abscess, MacEwen reports four cases, all of which recovered. These were undoubtedly traumatic cases. Körner reports 55 cases, with 29 recoveries. In the Transactions of the American Otological Society, 1907, I gave a collated report of 102 cases of cerebellar abscess, of which 69 died and 33 recovered. This is a rather high mortality and I was much comforted to hear Dr. King say in his discussion that most of the cerebellar cases died.

Now as to the method of operation. I think the Mosher wire drain is an excellent device, but unfortunately I have had very few brain abscesses since this was put at the disposal of the profession, and these have all been fatal; not on account of the Mosher drain, but in spite of it. As far as the method

of drainage is concerned, I think that the actual sort of drain used is of little importance. Experience has taught me that one thing to be avoided is too frequent dressing of these cases. I remember in my early cases, it was the custom to put the gloved finger into the brain at each dressing, so as to search out and evacuate any secondary collection of pus. To my mind the gloved finger, if properly educated, will do much less damage to the brain substance than any mechanical device. MacEwen's work teaches us that the less the brain is manipulated the better for the patient. If you read his cases carefully, you will find that he opened the abscess, inserted the drain and did very little after that. If the patient does well after the abscess has once been drained, the dressing should be changed very infrequently. My own preference is for an ordinary cigarette drain, carried far into the abscess cavity. As the brain tissue expands it pushes this drain out and you can replace it later by a thinner drain of gutta-percha tissue. Many other methods of drainage are probably just as good; I am simply stating my own experience.

Now as to whether we shall operate on these cases through the avenue of infection or through a sterile area is a point worthy of discussion. In the statistics which I collated of 100 cases of temporosphenoidal abscess, 37 were operated on through a sterile area, 18 of which were cured and 19 died. Forty-one were operated on through the avenue of infection, 27 cured and 14 died, so that operating through the avenue of infection seems to afford better results. You are certain that the abscess is on the left side of the brain when you have that curious symptom where the patient describes the use of an article but cannot name the article itself. If you have this characteristic aphasia, the statistics seem to show that the prognosis is a little better where these cases are operated on through the infected area rather than a sterile area. In cases of abscess on the right side of the brain where you have no localizing symptoms, these cases should be subjected to operation through a sterile area above the zygoma. In the case of a left temporosphenoidal abscess, we have definite symptoms if the abscess is present, and by operating through the infected area we are able, almost always, to find the stalk of the abscess, so to speak. This represents the avenue of infection, and has caused walling off of the arachnoid space over a considerable area, as so ably described by Sir Charles Ballance. By operating through the stalk of the abscess, very little danger of meningeal infection occurs; on the other hand, if the abscess is drained through an area where obliteration of the arachnoid space has not taken place, meningeal infection is most apt to occur, with fatal results. Inspection through a sterile area is a very safe procedure if proper technique is observed. I remember one case at St. Luke's Hospital where my colleagues felt certain that a temporosphenoidal abscess was present, while I did not agree with the opinion. This man had had a serious middle ear suppuration with sinus thrombosis and the mastoid wound had not entirely healed. In this case I isolated the suppurative area and exposed the temporosphenoidal lobe over the zygoma. Exploratory puncture was undertaken, with negative results; the wound was closed and the man suffered no ill effects from the operation, living for several weeks after the exploratory procedure. This shows that the brain can be explored through a sterile field with no fatal results.

Regarding the cerebellar abscesses in this series, 45 cases were opened behind the lateral sinus, with 25 cures and 20 deaths. Eleven cases were operated on in front of the sinus, four of which were cured and seven died.

Speaking of the two-stage operation relative to the cerebellar abscess, I would like to mention an interesting case in which the patient had a simple mastoid operation which did not heal, and developed vertigo. Coming under my observation, he had a dead labyrinth on the affected side and his spinal fluid under pressure showed a 15,000 cell count. I operated on him the same evening, and did a rapid radical operation and extirpation of the labyrinth, removing the posterior surface of the pyramid down to the internal auditory meatus, and removed the floor of the middle cranial fossa, thus exposing thoroughly the Trautman triangle. The patient had a slight definite nystagmus in both directions before the operation. Although I felt convinced that a cerebellar abscess was present, I hesitated about opening the dura because the field of operation was so foul. As nystagmus persisted to the affected side

in spite of labyrinth extirpation, two days later I entered the cerebellar substance through the *sacculus endolymphaticus* and drained the cerebellar abscess. The patient is now well nearly two years after the operation. There, I think, entering the brain substance at the primary operation would probably have been fatal. I also wish to point out the great importance that the presence of nystagmus to the affected side has upon the diagnosis. The persistence of nystagmus to the affected side made the diagnosis certain in this case.

Dr. Kennedy in his remarks mentioned the fact that cases of brain abscess have no temperature. This is true of the stage in which the neurologist sees these cases and in fact of the stage most of us see them in. There is, however, in most cases a distinct stage of invasion, and during this stage the temperature will range from  $102^{\circ}$  to  $104^{\circ}$ , with a high white cell and polymonuclear count. This stage frequently escapes observation as it is of short duration, but it should be remembered, however, that a rise in temperature after a simple mastoid operation may mean one of two things. It may be an ordinary post-operative rise in temperature, which we frequently see, but occasionally this means an acute invasion of the cerebral tissues and its possibility should always be remembered. I disagree with Dr. Kennedy that we should wait for the subsidence of a papilloedema before operating for brain abscess. The presence of the papilloedema indicates an increase in intracranial pressure and is an important indication for immediate operation. To wait until the swelling of the optic disc has diminished may sacrifice the lives of many patients.

DR. IRA COHEN: Mr. Chairman, there is one point I would like to make which can best be brought out by a diagram on the blackboard. It shows one advantage of Dr. King's method. If this circle represents an abscess cavity, the smaller circle inside would represent the rubber drainage tube. If we are fortunate, the larger circle will contract down uniformly on the smaller, as would a rubber ring. However, the contraction may not be uniform and as these subsequent diagrams show the outer circle contracts irregularly—the drainage tube is found in one end and the other side is shut off, forming a secondary abscess. This was brought out clearly by lipiodol injected into a frontal lobe abscess secondary to an ethmoidal infection. X-rays taken several days after the injection showed the lipiodol had not drained out, and a secondary abscess formed, which had to be drained. I feel this happens frequently. I have not used the metal drains which Dr. Cahill mentioned, but if the abscess cavity contracts down about them, they would tend to prevent such secondary abscess.

Cerebellar abscess takes a sad toll. Within the past few months I had under observation a case I thought was going to recover. The boy was discharged from the hospital apparently well except for a residual papilloedema. He returned in three weeks—the abscess was drained again. A third operation for drainage had to be done and the boy succumbed. I feel the occurrences of secondary abscesses by pinching off from the primary one is often a reason for our poor results.

DR. W. A. SCRUTON paid his respects to Dr. Cahill and expressed appreciation of the presentation of the wire-mesh drain. He stated that the apparent advantages of this form of drain are several, the outstanding being that it remains in position and the percentage of recoveries is unusually high.

In the course of his discussion, Dr. Scruton directed attention to the difficulties encountered in multiple abscess cases. He cited two of these cases; one of his own, in which three distinct abscesses were located at the same operation, and another of the late Dr. Shepard, of Brooklyn, in which five abscesses were located. The first case was discharged as cured; however, symptoms returned in about four months' time, when another abscess was located and drained. The patient did not recover. At the original operation the multiple abscesses were located by digital examination. The accomplishment of exploration of the brain for abscess may be facilitated by the use of a modified form of the ordinary bayonet forceps as developed by Dr. John R. Page. This instrument is available for inspection at the Manhattan Eye, Ear and Throat Hospital.

DR. MAYBAUM: If we may judge from the diversity of the procedures proposed for the treatment of brain abscess, the last word upon this problem

had not been written or spoken. Two years ago a prominent neuro-surgeon read a paper before the Ear Section upon the treatment of brain abscess. In brief, his procedure was to make a small trephine opening over the location of the abscess, aspirate the contents and do nothing more unless further symptoms presented, in which event this procedure was repeated. He cited cases of recovery from this method. We may assume that in each instance the abscess was small and well localized and that both the patient and the surgeon were fortunate.

From this simple procedure to that followed by Dr. King are extremes in the surgery of brain abscess. I believe that until Dr. King proposed his operation, the various operations done were very much alike. While I hardly believe that Dr. King's operation is indicated in all cases of brain abscess, I am inclined to regard his method a decided step forward. We have had experience with various materials used for drainage purposes, rubber tubing or dam or gauze, which frequently do not accomplish the purpose intended—effective drainage does not take place, secondary abscesses not infrequently occur. There is little knowledge of what is happening within the abscess wall. By means of Dr. King's operation, the abscess wall is before one's view at all times. Would Dr. King advise his operation in a deep-seated abscess, which, because of its location, may not herniate? Would he perform his operation in a left-sided temporosphenoidal abscess or in a cerebellar abscess?

The neurologist can be of help in determining the question of the time of operation. An acute abscess, before an attempt at wall of process has occurred, may result fatally if operated on too early.

The time has come when the neuro-surgeon, neurologist and otologist must actively co-operate in order to reduce the high mortality of brain abscess. Study of the subject from all aspects should be furthered.

DR. J. E. J. KING: The hour is late and we have but very little more to say. I wish to thank all of the gentlemen who have taken part in the discussion.

I was interested in one point that Dr. Hill brought out, namely, the development of secondary abscess after use of the drain. I have seen several autopsies in which the condition described by him had taken place. For this reason I gave up the use of a drain.

I greatly enjoyed Dr. Dench's discussion. Dr. Maybaum's remarks concerning a delay in operating upon the severe cases until the meningitis had subsided should be well considered. Those cases in which encapsulations has taken place evidently went through a stormy time previous to the complete encapsulation of the abscess. Therefore, if we could calmly wait until this condition has occurred and not allow ourselves to be rushed into operating upon them, it is my opinion that a larger number would recover.

## THE PHILADELPHIA LARYNGOLOGICAL SOCIETY.

*Regular Meeting, Tuesday, Feb. 5, 1929.*

**Case of Recurring Stricture of the Esophagus Due to Epidermidolysis Corrosa.** Dr. Phillip S. Stout.

*(To appear in a subsequent issue of THE LARYNGOSCOPE.)*

**Useful Office Routine Procedures.** Dr. M. Valentine Miller.

*(To appear in a subsequent issue of THE LARYNGOSCOPE.)*

### DISCUSSION.

DR. ALEXANDER: I would like to congratulate the essayist. He certainly said a lot of good things. I would like to make a suggestion. If he thinks it is worth while and conditions are accordingly, I would like to suggest that he operate on the boy, age 12 years, and I believe it is possible to bring his hearing up to normal. He need not have any untoward results. I have done a great many operations on children from the age of four years up with good results. I have records of many patients to corroborate this statement.

DR. STOUT: I do not wish to start a controversy with Dr. Alexander but I wish to say that you cannot do a submucous resection on a child of four years of age and not run a great risk of having the nose deformed. If too much operative work is done on the noses of children there is going to be trouble, especially if you take away too much cartilage. Let no young man think that he can do this and not run the risk of nasal deformity.

DR. COATES: I am glad Dr. Miller brought up the question of Eustachian tube applications. If you prepare an applicator for each patient when he comes in, it requires a good deal of time in the ordinary busy office. I have my applicators all ready in a glass tube, which saves time. Place the applicator in the Eustachian tube and put your patient aside with the applicator sticking right out. You can even let him stay out in the waiting room and take another patient in the meantime. Keep the applicator in there for from one-half to 1½ hours.

DR. WIEDER: I would like to make a suggestion applicable especially to those cases who have frequent recurring attacks of sphenopalatine neuralgia, in whom it is inadvisable to inject the ganglion with alcohol. To use cocaine persistently is to invite the habit, so that we have found that with 5 per cent solution of phenol in glycerin, we obtain just as good, if not more permanent results than cocaine when applied over the ganglion for about 15 to 30 minutes.

DR. SHUSTER: In reference to the question of doing a submucous resection of the septum in children to cure deafness, I wish to say that this operation, *per se*, will not improve deafness. The only time I do a submucous resection is when, because of deformities, I cannot get to the Eustachian tube for treatment. I cannot see how the removal of a ridge will improve the hearing. I have seen numerous patients who had been operated on with the object in view to cure their deafness, but no improvement could be noted. There are children about the age of 12 or 13 suffering from deafness that object to ear treatment and no one wants to bother with them. If I take sufficient time, and work patiently, nine out of 10 cases I can apply Eustachian tube treatment and get good results. I doubt if any beneficial result could be obtained in any of these children merely by correcting their septal deformities.

DR. MILLER (in closing): Concerning submucous resections, I have been reluctant to perform that operation in children under 16 or 17 years of age. There are a couple of points which I did not mention in the paper and which I should like to add. As Dr. Coates said, the use of ephedrin as a shrinking solution causes a more prolonged shrinking and that is one of the points which cause me to use it routinely. Another reason is the fact that it does not produce anesthesia of the lining of the tube and as a result one is not so apt to use undue pressure when the applicator encounters resistance and so cause injury to the mucosa. Frequently when cocaine is used, the applicator is with-

drawn stained with blood. That is rarely the case when ephedrin is used, as the operator is quickly warned by the patient when he is using too great force to overcome the obstruction.

The other matter is that of cleaning the applicators. The applicator should be laid on a flat surface and scraped with the edge of a sharp knife. The cotton should never be burned off, as that causes the applicator to become very brittle and may break off in the tube. Recently, in the clinic, I used an applicator which looked all right. I inserted it into the tube and after a sufficient time removed it, to find that it had broken about 25 m.m. from the end. The broken piece was withdrawn with the rest of the applicator only because the long fibre cotton which I had wound it with had held the two pieces together. It was a very fortunate and a very narrow escape from a serious affair. I found out afterward that the applicator had previously been cleaned by burning. If properly cleaned by scraping, the applicators may be used many times.

**A Study of Post-tonsillectomized Individuals.** Dr. Arthur J. Wagers.

*(Appears in full in this issue.)*

DISCUSSION.

DR. WAGERS (in closing): Studies of this character are valuable but require an immense amount of time. This time and effort would be well spent could one have complete co-operation of the patients in the matter of reporting for examination subsequent to operation.

An article was published in the journal of the American Medical Association in 1922, in which the writer detailed the pre-operative and post-operative findings in 5,000 out of a total of 10,000 cases operated upon within a period of five months. I do not know the method employed in securing re-examination in these cases, but the results obtained from my own "follow-up" system were very discouraging. In a number of selected cases a second call for re-examination was sent out, only to be ignored, as had the first one.

**Frequency Characteristics of Speech and Hearing, With Demonstration of New Audiometer.** Dr. Douglas Macfarlan.

Dr. Macfarlan exhibited and demonstrated various audiometers.

1. *The original buzzer type* of audiometer was one of the earliest audiometers used. At first they were operated by a clock mechanism, similar to Barany's noise apparatus. The clock, with its clapper, was placed in a box insulated with felt. From the box the sound was led off through stethoscope tubes to the ear. Similar in principle is the Filling-McCallie audiometer, which uses the clapper dropping against a bell. The 3-A buzzer audiometer of the Western Electric Company developed the buzz over a telephone circuit. The interruptions producing the telephone "noise" was accomplished by wiring an interrupted electro-magnetic circuit of the bell announcer type (see Circuit Plans for Inexpensive Audiometers, Archives, 1928).

Three years ago I began using the hum that is present in the house current. It was a simple matter to cut down intensities so that the phone could be used, but it was difficult to get the proper resistances to obtain a complete fade-out of sound. Such an audiometer, operating from the street current, makes a very light and convenient affair, with no battery renewal inconvenience. The Western Electric 3-A was very heavy and cumbersome. The circuit plans for this audiometer are described in the Archives, 1928, and the machine should not cost more than \$30 to assemble. The noise that it produces ranges from the smallest audible sound to an intensity at which the vibration is felt as well as heard (tactile threshold). It is unnecessary to set an instrument to any louder range, since when patients are reporting sound within the tactile range, the examiner cannot tell whether feeling or hearing is reported. The deafness at any event is well above the possibility of any useful hearing.

2. Two models of phonograph audiometers were shown. The 4-A audiometer is that being used to test the school children. The test is not one alone of hearing but of mental factors of hearing, alertness, attention, concentration, education, familiarity, fatigue, and the like. The test words used on the records are numbers which are spoken in steps of decreasing intensity.

Each intensity is tested with only one number; the child writes down what he hears. The test is repeated four times for each ear. A key sheet is used

to correct the papers. The grading is according to "percentage hearing loss". I do not believe we are yet ready to say what normal hearing or percentage hearing loss is. The matter can only be worked out after long experience; it properly belongs to the sphere of the physiologist. My personal preference is for imperial units or for electrical units, such as the telephone unit (T.U.), or sensation unit (S.U.).

This other phonograph audiometer is one which I assembled some years ago, using the Bristol pick-up. No tubes are necessary and loud amplification with good reproduction is obtained. The intensity is controlled by a potentiometer and the threshold-hearing-intensity can be tested by any quantity of numbers or words at any intensity level. There is a hand microphone which can be switched into the telephone circuit and the examiner can speak words to the patient. This machine I have installed in schools for the deaf child so that he may be taught through his residual hearing. John Dutton Wright has been the staunch advocate of the aural method for these children. The method is being enthusiastically taken up by a number of schools; at least 15 schools are using it. Dr. Shambaugh has described the use of the method in the Illinois State School (Archives). Two other similar instruments are now on the market, that of E. A. Myers, of Pittsburgh, seems to me to be the best one yet developed. There is a great help to the child in being able to see and hear the teacher speak, and then to speak into the microphone and hear his own voice.

3. Next is shown a continuous range audiometer, giving any desired pitch up to 8,000. The hearing for any pitch can be tested by use of an intensity control. Bunch, Kranz and Knudsen have been using such audiometers. The first one invented was that of Dr. Guttmann, of New York. The 1-A and 2-A audiometers (Wegel and Fowler) of the Western Electric are the only ones on the market. These use octave steps, which Dr. Fowler has found to be practical as compared with the continuous range, there being no deafness dips between octaves that are missed. Bone conduction receivers have been much experimented with, but they do not seem to me thoroughly satisfactory. Personally, I doubt if anything new can replace the forks and the monochord in getting the valuable contrast between A.C. and B.C. This audiometer shown works on the principle of beat-tones, a construction which cuts down the cost considerably.

Finally, there is shown a panel containing all the well known aids to hearing. One or another can be rapidly switched on to obtain a rapid contrast as to their benefit to hearing. A Scotch girl was the first to conceive this idea; it works out well for anyone trying to determine which aid should be bought.

Phonograph records were played showing the effect of dampening out different pitch bands. The effect on both music and the voice is seen. We can conceive that we are hearing these sounds just as the deaf hear when they have lost the hearing at certain levels. The records are from the Bell Laboratories.

Seashore's records to test musical talent were demonstrated. The test should be made on all persons setting out on a musical career, and on children whose parents are spending money on a musical education.

The interest in the problems of deafness has received a marked impetus in the last few years, and justly so, for there are many thousands of deaf in the country (over 18,000 children without hearing or language). There are many thousands more who are hard of hearing. The economic loss is enormous. The general public looks to otologists to tell them something about deafness when they come to them with their deafness.

#### DISCUSSION.

DR. BABBITT: I would like to ask about the intensity of the tone on B-pitch audiometer. Can it vary from day to day?

There are a great many popular devices for testing doubtful existence of hearing. My own suggestion is the use of a whistle, followed by something good to eat; for example, candy. This is to determine if the child by hearing the whistle learns to expect the sweet.

DR. MACFARLAN (in closing): The intensity of any pitch on the beat-tone audiometer can be controlled by a potentiometer. The tone can be made to fade out or can be made very loud.

The instrument does not vary from day to day and can be readily checked and corrected by fork comparisons if it has been tampered with.

*Regular Meeting, Tuesday, March 5, 1929.*

**The Report of a Case of Chronic Suppurative Otitis Media With Labyrinthine Symptoms; and**

**The Report of An Operation for the Removal of Exostoses of the External Auditory Canal, With Some Remarks On the Modified Radical Mastoid Operation. Dr. John Randolph Page.**

*(To appear in a subsequent issue of THE LARYNGOSCOPE.)*

DISCUSSION.

DR. COATES: We are very fortunate in having Dr. Page with us this evening. He has given us two different subjects to discuss. His interesting labyrinth case brings up the subject of labyrinth operations and in cases of this nature it is often an impossible diagnosis to make. Not all cases will have such a happy result as Dr. Page's did. Hearing and the vestibular function may not return. One case I had last winter, where it evidently started as a diffuse serous inflammation, showed a progressive loss of hearing. The last time I saw her, the function had not returned, but there was no further suppuration in the ear. To operate on a case of diffuse suppurating labyrinthitis before the channels leading to the meninges had been closed off would be an error, unless intracranial complications were imminent.

Now, the question of the modified radical mastoid operation is always open for discussion. At the Ninth Otolaryngological Congress, where physicians from all over the world were present, Mr. Heath presented his famous operation, and was promptly taken to task by the otologists. The trouble has always seemed to be that Mr. Heath could not give his pathological indications for his operation. Blackwell gives in his presentations a much more definite outline of indications for operation. He also removes the outer wall of the attic, which makes it a little bit more of an operation, but might add a good deal to the results. Not all cases of chronic suppuration of the middle ear and mastoid should have radical mastoid operations done on them. Operations should be selected that will best suit the individual case. If, as your X-ray will show, you have a case of cholesteatoma of the mastoid process of course nothing short of a radical operation will do. In cases of less duration and with less destruction of middle ear, a milder operation can be performed. If you do a radical operation, where there is good hearing, you subject the patient to the chance of having his hearing interfered with. By doing a modified operation, there is a chance of some improvement taking place. If the middle ear alone is involved, with the mastoid process sclerotic, no mastoid operation at all is indicated, but an ossiculectomy will give relief, particularly the modified operation of Tobey, where the external wall of the attic and additus is taken away.

DR. MACKENZIE: I would like to ask how extensive were the polypus in this case.

The labyrinth has been an interesting subject to me for many years.

From the functional test findings in Dr. Page's case there seemed to be a reasonable doubt as to the existence of total loss of hearing. In the case of labyrinthine suppuration secondary to a middle ear suppuration, acute or chronic, there is a total loss of hearing of acute onset.

I am quite interested to know just how Dr. Page worked the two noise-producers in making his test for unilateral deafness. I demonstrated, before this Society, my combined method of Barany noise-producer and speaking tube as an ideal test for unilateral deafness. In a case with questionable deafness on the right side, when a noise-producer is introduced into the left ear and a speaking tube into the right, the patient is not able to hear words spoken with a loud voice.

In a diffuse serous inflammation secondary to middle ear suppuration, the patient may have vertigo, together with nystagmus directed toward either side, but more often toward the diseased side; whereas, this patient had nystagmus toward the unaffected side. The turning test findings were not given, the caloric test was negative. A number of years ago I demonstrated a patient before this Society who had a large polyp that filled up the major part of the external auditory canal. I tried the caloric test and it was negative. After

removing the polyp the reaction became positive, proving that polyps alone can be a cause for a negative caloric reaction. When making the caloric test we must be sure that there are no such handicaps.

In 1927, when preparing a paper on labyrinthine suppuration for the American Laryngological, Rhinological and Otological Society, I had occasion to look up the literature and microphotographs made by numerous authors and in none that I reviewed was I able to see a case of diffuse serous labyrinthitis. They all showed a circumscribed lesion. In this case I understand there was a dark spot showing on the prominence of the external semicircular canal. Now, it is quite possible that the labyrinth can become involved in a mild grade of inflammation from the extension into the inner ear of bacterial toxins from a suppurating middle ear. The toxins seep into the labyrinth and produce a serous form of inflammation. In all these cases, however, the lesion was circumscribed and after cleaning up the suppuration in the middle ear there was considerable restoration of function afterward, as in Dr. Page's case.

I would like to emphasize one point made by the essayist, and that is no one is warranted in jumping to conclusions without sufficient data. In the presence of an acute labyrinthine suppuration, in the cases I have studied, the results are very satisfactory from operation. I reviewed a series of 51 cases operated at the Politzer Clinic prior to March, 1908; there were no fatalities in the operated cases. I know of two cases of labyrinthine suppurations that were operated radically so far as the mastoid was concerned, but the labyrinth untouched. Both cases terminated fatally. It is safer not to operate at all in the case of labyrinthine suppuration than attempt any half-way measures. Indeed, to operate on the mastoid without operating the labyrinth is a very dangerous procedure.

DR. DINTENFASS: I was particularly interested in what the essayist had to say about the labyrinthian case, because just at this time I am having a similar experience. A week ago a young woman was sent to me with a history of a left-sided otorrhea for 20 years. She complained severely of nausea, vomiting, vertigo and a sensation of falling to the left. The examination disclosed a combined rotary horizontal nystagmus when looking to both right and left, more marked, however, when looking to the right. The tuning fork placed in the middle of the head lateralized the Weber to the left, or poor ear. As she lay in bed she said she felt her body turning first to the left and then to the right, where it was more pronounced. At the same time she experienced a throbbing of the left side of the head and with every throbbing there was a feeling of extreme nausea. Purposely the turning, the fistula and the caloric tests were not employed, as we believed that in this particular instance their use would entail some danger. Five days ago I performed a left radical mastoidectomy. The removal of much cholesteatomatous material revealed an eroded horizontal canal. This area was left undisturbed for obvious reasons. On recovery from the anesthetic the complete disappearance of the vertigo and the nystagmus was most significant. I would like to ask Dr. Page his opinion of the pathology in this case and the explanation for the improvement.

DR. STOUT: I should like to ask Dr. Page what he thinks are the indications for modified radical mastoid operations. Each operator seems to have his own idea of just what the indications are.

DR. PAGE (in closing): In reply to Dr. Coates, I agree that the return of function in cases of labyrinthitis is unusual. This case was reported because it was exceptional. It is contrary to the usual cases of labyrinthitis associated with chronic suppurative otitis media, in that the function returned after a very violent labyrinthine disturbance that had entirely destroyed the function for a considerable period of time.

In regard to the modified radical mastoid operation, I do not think Heath's operation should be spoken of in connection with it. Heath's operation was confined to the region of the mastoid antrum. In the after-treatment of the cases Heath operated on in Boston some years ago, the growth of granulations that sprung from the hard but infected bone in the mastoid could not be controlled, and the cases were all failures. Heath's operation and the Stacke operation are obsolete for the same reason. They are confined to the region of the antrum in the mastoid, and they leave bone in the mastoid that is not

conducive to healthy repair, although it is not softened or broken down. In the modified radical mastoid operation, the whole mastoid is extirpated, because experience has shown that hard bone may still be infected bone, and from this infected bone unhealthy granulations persist in forming.

In Tobey's operation for ossiculectomy and drainage of the antrum, that Dr. Coates speaks of, the aditus is widened and the antrum opened through the postero-superior canal wall. It is almost as extensive as operation, so far as the mastoid is concerned, as some of Heath's, though no change in the meatus is made. This operation, while regarded generally as a more conservative operation than the modified radical, is, I think, decidedly less conservative, in that it removes the ossicles and diminishes the hearing, while the modified radical preserves the ossicles and usually improves the hearing.

In reply to Dr. Mackenzie, there were no polyps in the canal nor in the tympanum to interfere with the caloric reaction. I said that through an old perforation in the lower part of the drum, polypoid material could be seen. I meant degenerated lining membrane, polypoid in appearance. The noise apparatuses were the Barany instruments. Two were used to demonstrate, first, that all hearing in both ears could be excluded by using both together, as with some of the instruments of this type this is not the case, because the noise from one of them is too weak to exclude loud sounds. With an instrument sounding in each ear, there was no hearing. When the instrument in the right ear alone was sounded, there was hearing with the left ear, but when the apparatus in the left ear alone was sounded, no sound could be heard with the right ear.

In reply to Dr. Mackenzie's remarks about the turning tests: No turning tests were permitted, nor were any other tests disturbing to the patient, except the caloric and noise apparatus, used until ample time had been allowed for the acute symptoms to subside and the communications with the meninges to become walled off. Leukocyte counts were taken, but lumbar puncture for cell counts in the spinal fluid to determine early signs of meningeal involvement were not, for fear the reduction of intraspinal pressure might tend to induce passage of infection from the labyrinth to the meninges.

Dr. Mackenzie's remark about the involvement in the region of the oval window and the horizontal canal is a point well taken. Friesner speaks of such a labyrinthitis as I think he refers to. (What I referred to here is described in Braum and Friesner's book, namely, that on section, bacteria had been found accumulated in the recesses of the oval and round window, and it was thought that toxines elaborated by these had passed through the annular ligament and membrane of the oval window to cause inflammation and exudate in the perilymph and endolymph spaces that were, however, free from bacteria.)

I rather agree with those who do not operate during an attack of acute labyrinthitis and think rest and quiet the best treatment, but if operation does become indicated because of signs of extension to the meninges, the labyrinths, as well as the mastoid should be operated on.

I understood Dr. Dintenfass to say his case had a Weber to the diseased ear, and a disturbance of the labyrinth that was relieved when the diseased mastoid was operated on. I don't understand the nystagmus to the sound side if the labyrinth in the diseased side was functioning.

In reply to the question as to the indications for the modified radical operation: I think one should be guided by the conditions found at the operation and that one should not proceed to do a radical mastoid operation unless he is led to do so by the disease found in the tympanum. The modified radical operation will be successful in many cases in which heretofore the radical mastoid has been performed. In these cases it can be performed with safety to the patient, and it will better preserve the function of the ear than the radical mastoid or the ossiculectomy operation.

## MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

### SECTION OF OTOLARYNGOLOGY.

Ramsey County Medical Society Library, St. Paul, Minn.

*Meeting of Feb. 8, 1929.*

Dr. E. R. Bray, President, presiding; Dr. Walter E. Camp, Secretary.

**Diseases of the Paranasal Sinuses in Children.** Dr. Harold Lillie.

#### DISCUSSION.

DR. CARL LARSEN (St. Paul): This is a subject which I feel we, as rhinologists, until recently have sadly neglected. Dr. Dean first brought this subject to our attention, and pediatricians were quickly alert to give this subject the serious consideration it deserved.

The vicious circle of sinus disease causing systemic infections, such as arthritis, eczema, asthma, chorea, bronchiectasis, malnutrition, nephritis, pyelitis, colitis, etc., has, I believe, not been over-estimated.

These children are usually referred to us because of frequent or constant colds, and have a nasal discharge, with or without the various systemic manifestations. One point that has impressed me in my observations is that the majority of these children have a mucus discharge; while in the adult, unless the condition be hyperplastic, the discharge is decidedly purulent, which leads me to feel that the greater number of these cases are of the hyperplastic variety. This decision is further verified by the very small percentage of maxillary aspirations and washings that show a definite bacteriological content.

The pathology is submucosal and the changes are hyperplastic, rather than suppurative.

Roentgenogram examinations further confirm these observations and only in a very few was a definite empyema demonstrable. Dean states that the main value of the Roentgenogram is to tell whether or not a given sinus is present, and, if present, whether on an anatomical basis it has clinical significance.

The great majority of the reports regarding X-ray examination read about as follows: X-ray examination of the sinuses shows considerable clouding of both ethmoidal regions and a slight or marked clouding of one or both antrums. The appearances are those of a hyperplastic pathology, and are not suggestive of a purulent condition.

Assuming that we have a definite sinus condition, whether purulent or hyperplastic, and in my opinion the former is far more amenable to treatment, unless it be too extensive, our first duty is to exhaust every available means at our command to find the cause.

Sensitization tests, the environment of the home, the child's diet, the amount of fresh air and sunshine, the proper rest, the presence of infected or hypertrophied tonsils and adenoids, the condition of the nasal chambers with regard to the proper breathing room and efficient drainage are all factors which require careful consideration.

There can be no question but that dietary deficiency exercises an important part in a great many of these cases, which Dean has so ably demonstrated. Perhaps the endocrine system is responsible for many of these cases.

If the cause is found and corrected, the treatment is rendered comparatively easy. If, however, no cause is found, the tonsils and adenoids have been removed (and this represents by far the greatest number that present themselves to us), what course of treatment are we to follow? If the case is a suppurative one and does not respond to conservative treatment, in addition to general hygienic measures, I believe we are all agreed that the case is a surgical one and should be so treated; and in the cases involving the maxillary

sinuses, this is comparatively easy of performance. If, however, we are dealing with a hyperplastic form, bilateral as most of them are, involving a majority or all of the sinuses, which many do, I must admit, many times, my inability to know just what to do.

I have opened a great many of these sinuses, found little or no apparent pathology, and, in many instances, with no benefit to my little patients. We all know how unsatisfactory these cases are in the adult, and why should it be more satisfactory in the child? I certainly urge conservatism in the surgical treatment of hyperplastic sinusitis in the child. Sunshine in many of these cases is a specific, and I am almost led to believe that if sunshine, cod liver oil and proper dietary measures have been instituted and have been of no avail, surgical interference must be seriously considered.

This is a subject of growing importance, and one that should have the serious consideration and co-operation of the pediatrician and the rhinologist.

DR. FRED PRATT (Minneapolis): It certainly is refreshing to hear Dr. Lillie talk on this subject. At the General Hospital the pediatricians were very enthusiastic about antrums, but I just couldn't see it; perhaps I was just stubborn. A number of years ago I met Dr. Dean on the train and spent a couple of hours with him. I asked him of all the children in his clinic, how many had antrum trouble and how many were operated. He said "only a few". That was one of the reasons why I did not become very enthusiastic. Another thing that possibly changed my opinion is that at the General Hospital we have cases come in from Lymanhurst. These cases would come over with a diagnosis of "sinusitis" perhaps a week or two after the X-ray had been taken at Lymanhurst. Our pictures were negative. That led me to wonder whether these cases would not clear up themselves. Another thing that made me wonder was this: Isn't it possible in the development of the sinuses, particularly the antrum, that some of the secretion is not absorbed and lays in the antrum; and that the antrum can be more easily infected? How many times we have washed these antra and all we have had is a little mucus, no pus. Most of these cases are no different afterwards than before. In the real infected cases we have to go on the pediatrician's diagnosis of course. He has watched the case, and we irrigate if necessary. But doing it indiscriminately is wrong.

Just out of curiosity I had the reports gone over from the General Hospital for six months, from last July until the first of the year. Twenty-seven cases came in with a diagnosis of sinusitis. I suppose X-rays were taken, because they are ordered. Of the 27 cases, 10 of them after washing were absolutely negative so far as the surgeon could detect. Out of the 17 there were 54 antra that were washed and 13 of them were negative; 12 had +1, which means possibly a little mucus; five had +2; six had +3; and eight had +4. Of course the +4 would be a real case of pus. This leaves a very small number that were actually positive.

I still feel that too many of these antra in children have been washed out. Of course, as Dr. Lillie says, we have to have enthusiasts. I believe, as he says that these cases should be treated conservatively. Of course cases that have arthritis must be taken care of. I hope Dr. Lillie will come back again and give us another talk.

DR. J. T. LITCHFIELD (Minneapolis): I would like to ask a question. In these antrum cases that have mucus in the nose, how do we know when we wash these out that we are washing secretion out of the nasal fossa?

DR. FRED PRATT: One other point in connection with these cases that I forgot to mention: in the first place, we must have drainage and we must have ventilation. Dr. Dean said that in these cases he did a tonsil and adenoid operation and most of them got well. We must have drainage and aeration, and the one way to get it is to do a tonsil and adenoid operation to get the air going through the nose.

DR. HAROLD COOPERNAN (Minneapolis): In the matter of differential diagnosis and of nasal discharge, in addition to the three points which Dr. Lillie brought out, I think perhaps there is another factor which should be considered. It is usually associated with unilateral discharge, but there may be bilateral discharge. Some time ago a case came into the Out-Patient Depart-

ment of the General Hospital. An X-ray was taken, and the plate was positive. In this case I punctured the antrum and got no returns. I happened to wipe out the nostril and felt something that did not belong there, and on closer inspection and investigation I removed an eraser. I think foreign bodies should be thought of in making a differential diagnosis.

DR. H. McL. MORTON (Minneapolis): As Dr. Pratt knows, I had been a great sufferer myself from sinus trouble and have finally had great relief. There are two points I wish to mention; one of them Dr. Lillie has already touched upon; and that is the matter of the ingestion of carbohydrates. I found a most remarkable relationship between my sinus trouble and my diet. I was very septic and lost several pounds, and found that through repeated irrigation I nearly established a cocaine habit, which I discovered in time, and would not have cocaine used. I had a large opening made, had thorough ventilation, and obtained the greatest possible relief. Drainage is important of course, but it is closely associated with ventilation. As to the ingestion of foods, I found, and still find, that a marked decrease in my carbohydrate intake starts the trouble up so clearly that there can be no question about the relationship. Also, salt will increase it. Either salt or sugar will start it up again.

DR. KENNETH PHELPS (Minneapolis): Dr. Lillie's presentation of this important subject was very interesting to all of us, I am sure. My object in discussing his paper is to present some figures from the diagnostic standpoint. These figures were obtained at the Minneapolis General Hospital, where we have a pediatric nose and throat service. One hundred eighteen cases with pediatric conditions had their antrums irrigated, and 50 per cent had secretion in the sinus. These findings were compared with the X-ray findings. About 50 per cent of the positive plates were positive sinuses. About 70 per cent of the negative plates were negative.

In other words, the mere presence of a disease due to focal infection is as good evidence of a sinus infection as is a positive plate.

Dean brought out this point in his group of arthritis cases when he found sinus infection in 100 per cent of cases, regardless of the X-ray or clinical evidence of sinusitis.

To me these figures are interesting, but I do not consider them final.

DR. W. W. LEWIS (St. Paul): I think the prefacing of all sinus investigation in children by the routine taking out of tonsils and adenoids is a modern disgrace. The amount of compensatory tonsil (lymphoid) tissue that develops on the neighboring pharyngeal surfaces after operation proves the necessity of tonsil function in children. The day is rapidly approaching when there is going to be a tremendous reaction against this massacre.

DR. CARL W. WALDRON (Minneapolis): I was much interested in Dr. Lillie's presentation. In regard to the fresh air fad and the question of humidity, I heard Dr. J. A. Myers speak before the Lymanhurst Staff, Public Health, Tuberculosis and School Nurses on the subject of "Fresh Air Fads". He outlined the subject in a scientific manner. Apparently, according to ventilation engineers, in a room with all windows closed there is a complete change of air in from  $1\frac{1}{2}$  to two hours. He also outlined the absolute foolishness of outside sleeping porches in winter. Now, Dr. Myers is not a rhinologist, but he is a man who is nationally known from the standpoint of his chest work.

It was very interesting to hear him point out to those nurses the bad effects of this fresh air propaganda that has been carried out all in good faith. Most people live in a warm room during the day with insufficient humidity. By letting in the cold air at night, the already deficient humidity is immediately taken up by the air and then the nasal mucosa is subjected to very marked irritation at zero and subzero temperatures.

I feel that we, as rhinologists, should take it upon ourselves to warn adults, and particularly parents, of the bad effects upon the nasal mucous membrane of the exposure to extremely cold and dry air during sleep.

DR. GEORGE E. MCGEARY (Minneapolis): In regard to the question of humidity, I have three sons, ages nine, five and three years, who are probably just as bad, if not worse, than other children about going outdoors in the winter without sufficient clothing. Up to this winter the nasal colds among

these three children were so common that I doubt if at any time all three children were free at the same time from a cold during the winter months. Fourteen weeks ago I had installed in my home an air washer. With the air washer operating about two-thirds of the time, I found I could keep the relative humidity in the house from 6 to 48 per cent, this being governed by the temperature without, the temperature having ranged from 20 degrees below zero to 20 degrees above zero. For 14 weeks there has not been a respiratory infection in the house. This, in spite of the fact that two of the children continued going to school where almost half the pupils were out with influenza during the month of December. I am of course not positive that the comparatively high humidity has been the important factor in this, but it is by far the longest period of time that my home has been free from respiratory infections that I know of. The relative humidity was measured at all times by a Tycos hygrometer.

DR. F. N. KNAPP (Duluth): Some children are seen who present a chronic infection of the nasal sinuses. The mother usually states that the patient has had continuous or repeated head colds, nasal discharge, and that they breathe through the mouth a great deal. Of course they offer the diagnosis that the children are suffering from enlarged adenoids. This brings up the question of the relationship of tonsils and adenoids to sinus disease. The majority of the children have already had tonsil and adenoid operation, but no relief from nasal obstruction or mouth-breathing.

In a series of 20 cases, 12 had already had their tonsils and adenoids operated. This seems to indicate that there was either a mistake in diagnosis at the time of the tonsillectomy or else the removal of tonsils and adenoids did not improve the sinus infection already present.

Removal of tonsils and adenoids is possibly a prophylactic measure against further sinus disease, but children suffer from this disease in spite of removal of tonsils and adenoids. The author is convinced that many of these children have undergone tonsil and adenoid operations without a careful differential diagnosis of their head condition. Physicians must constantly be on guard against the parents' diagnosis of tonsils and adenoids. Children with continuous head colds must always have a careful post-nasal examination. X-ray of nasal sinuses is essential. This will reveal many cases of infected antrums in children if done routinely and the diagnosis is readily confirmed by irrigation of the antrum.

DR. HAROLD LILLIE (in closing): Unilateral purulent discharge may be caused by foreign body, as Dr. Cooperman has brought out, but inspection of the nose will usually reveal this as a cause. The discharge from the nose in sinusitis may be unilateral, and in cases where the disease is unilateral our problem is much easier. Dr. Larsen has summarized the whole situation completely. It is my opinion, however, that in too many instances, the bacteriologic and microscopic findings have been given more than face value.

It can be safely said, I believe, that sinus disease does not act as a focus of infection nearly as often as does infection of the lymphoid tissues. Occasionally, sinus disease does act as a focus of infection and much has been made of it. Search for the focus of infection is not complete, in any sense, with the examination of the ear, nose and throat.

Our findings regarding the value of X-ray examination conforms exactly with what Dr. Phelbs has brought out. In children, we are just as likely to have positive nose findings with a negative plate, as negative nose findings with a positive plate. However, I am not ready to subscribe to the proposition that we should operate on these children if our examination is negative, even though the pediatrician finds no other focus of infection. Expectant observation in these cases will usually bring out the important focus.

What Dr. Pratt says about drainage and ventilation is very true. In my opinion, we must not only treat the patient from the standpoint of the nose condition, but should see that the environment and hygiene are well taken care of.

This whole problem is very important and while I am open-minded about it all, I am not constructed to become too enthusiastic about any treatment which does not seem logical and reasonable.

## BOOK REVIEWS.

**Diseases of the Ear, Nose and Throat, Medical and Surgical.** Wendell C. Phillips, M.D., ex-President, American Life Association; formerly Professor of Otology, New York Post-Graduate Medical School and Hospital; Surgeon to Manhattan Eye, Ear and Throat Hospital; ex-President, American Medical Association; ex-President, American Laryngological, Rhinological and Otological Association, New York. Seventh revised and enlarged edition, 922 pages, illustrated with 615 half-tones and other text engravings, many of them original, including 37 full-page plates, some in colors. Philadelphia: F. A. Davis Company, 1928. Price \$9.00.

This is the seventh edition of Dr. Phillips' well known text and the author has added many recent contributions which bring his book well up to date. It consists of 885 pages of subjective matter and is liberally illustrated by 615 figures. There is a five-page formulary which is in use at the Manhattan Eye and Ear Infirmary. This forms a valuable help for reference in prescribing.

The author outlines the equipment of an office in the opening chapter. Many valuable hints are to be found by those interested in keeping their equipment up to date and at the same time make the best use of the space available.

In the chapter on Tests for Hearing, the Audiometer is given its deserved place and school group-testing, with which Dr. Phillips is so familiar, is well described.

A complete new chapter has been added, entitled, "The Hearing Problem", to which Dr. Phillips refers as follows in the preface—"I have portrayed not only to otologists but to general practitioners and social workers, a concise outline of this problem in all its phases." It is the reviewer's opinion that in the future, no textbook on otology will be considered complete without a chapter on this vital question.

In the discussion of the treatment of purulent labyrinthitis, the author presents some interesting new opinions from a personal communication from Neumann, of Vienna. These include the technique of opening the cochlea, the semi-circular canals and the vestibule without exposing the dura at the internal auditory meatus.

There is a complete section of the book, comprising 88 pages, which deals with the influence of general diseases upon the ear, nose and throat. Tuberculosis, lupus, syphilis, diphtheria and the acute exanthemata are given attention.

The connection between nasal sinusitis and gastro-intestinal symptoms in infants is carefully gone into; the same condition in mastoiditis is also discussed. Diseases of the nose and throat are clearly described and numerous hints and prescriptions are offered. These are of value for reference; backed by the experience of the author, they must of necessity be of value.

In the closing three chapters of the book dealing with Endoscopy, only the Jackson technique and instruments are described. M. F.

**Nasal Neurology, Headaches and Eye Disorders.** Greenfield Sluder, M.D., F.A.C.S., Clinical Professor and Director of the Department of Otolaryngology, Washington University School of Medicine, St. Louis. With 167 illustrations, including 2 color plates. St. Louis: C. V. Mosby Company, 1927. Price \$11.50.

This book is undoubtedly one of the few books of the past decade which could not have remained unwritten without a great loss not only to rhinologists but also to ophthalmologists, neurologists and internists. Sluder contributed much to rhino-laryngology but this monograph bids fair to be his crowning achievement and it is to be regretted that he was not longer spared to us, not only to continue his efforts and studies but also to enjoy the prestige and honor he so well merited.

Jonathan Wright contributes the opening chapter of the book with views of microscopic sections to show the pathological anatomy of the nasal sinuses. In only too brief a chapter does Wright describe the pathology for the knowledge of which we are so indebted to him.

Sluder describes various clinical pictures which have to do with neurological conditions in and about the nose. Vacuum frontal headache, anterior ethmoidal neuralgia and nasal ganglion neuroses are often neglected by the rhinologist because of the lack of physical findings in the nose. One of the commonest causes of these conditions is stated to be an occlusion of the hiatus semilunaris by apposition of the uncinate process and the bulla.

Great stress is laid on the close relationship of the sphenopalatine ganglion and the posterior group of nasal sinuses. The syndrome presented by disease of the ganglion consists of vasomotoric, neuralgic and secretory phenomena which are also associated with numerous other cranial and visceral nerves. Sluder admits that many of his theories are purely speculative and does not attempt to offer explanations for many of them.

Sluder insists that good results from surgery in these parts comes chiefly from accurate diagnosis and from the ability of the surgeon to differentiate the pathology found.

Proetz's method of displacement irrigation is recommended in the treatment of ethmoidal sphenoiditis. When surgery is necessary for this condition, Sluder contends that the middle turbinate must be resected to allow adequate approach to the ethmoidal capsule.

In the orbital abscesses due to ethmoid sinusitis, Sluder removes the middle turbinate and by means of a special small, angular knife, opens into the orbit by going across the ethmoidal capsule.

A chapter of 113 case histories describing the conditions presented in the text, bring the book to a close.

M. F.

**Technique and Method of Use of Sternberg's Gastroscopy and Gastroscopic Treatment.** With Sternberg's Cysto-Gastroscopic Apparatus. The Employment of Gastroscopy, With Special Reference to Gastroscopic Technique for Practitioners and Students. By William Sternberg, Berlin. Seven illustrations. London: John Bale, Sons & Daniellson, Ltd., 83-91 Great Titchfield street, W. 1 Price 3 shillings 6 pence net. 1929.

This work is in the form of a 20-page monograph which concisely in routine manner describes the entire procedure of gastroscopy. The preparation of instruments and patient is outlined, then the author's technique is described, with illustrations. Errors to be avoided are clearly enunciated and there is a chart demonstrating the various kinds of pyloric pathology.

Despite the fact that this little monograph gives the impression of a little self-advertising, it can be heartily recommended to all interested in gastroscopy.

M. F.

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## IN MEMORIAM



**CHARLES A. TODD, M.D.**

Dr. Charles A. Todd, retired St. Louis physician and pioneer otologist, passed away at Miami, Fla., February 23, 1929, aged eighty years.

D. Todd, for many years Professor of Anatomy and Otology in the Missouri Medical College, retired from active practice about 1892, wandered to Florida and the Bahama Islands, passing his last days at Miami. He was born in St. Louis, received his B.A. and M.A. Degrees at Washington University, attended the old St. Louis Medical College and the College of Physicians of Columbia University. He studied abroad in Paris, Vienna and Berlin for three years and on his return became Professor of Anatomy at Missouri Medical College, which was later absorbed into the School of Medicine of

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Washington University. He founded a Museum of Comparative Anatomy and was recognized for his special qualifications in this field.

He established the first clinic for Ear, Nose and Throat Diseases west of the Mississippi River, at St. John's Hospital and founded and edited the St. Louis Courier of Medicine. He was a Fellow of the American Otological Society almost since its inception but resigned his membership when he retired from active practice. Dr. Todd took an active interest in legislative measures bettering the standards of the profession and fostered the law requiring the examination of applicants to practice medicine, the examination of internes at hospitals and regulations on the dissecting of bodies.

Dr. Todd leaves no immediate relatives and never married. He was a cultured gentleman, an idealist and philosopher, interested in the arts and sciences, in addition to his deep interest in comparative anatomy and his practical professional interest in otology.

A personal note may be added to this memorial sketch in that the writer received his first stimulus and interest in otology as an undergraduate in the clinic of this pioneer otologist. The bond of fellowship created in these, my early medical days, continued throughout the life of this retiring, sensitive, esthetic man.

In the early Transactions of the American Otological Society a number of his contributions will be found and they all show the earmarks of the careful observer and the real scientist.      M. A. G.

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### GHERARDO FERRERI.

Dr. Gherardo Ferreri died in Rome, January 22, 1929, in his seventy-third year.

Dr. Ferreri was one of the pioneers of Otolaryngology in Italy and was instrumental in placing the specialty on the high pedestal that it now occupies. He graduated from the University of Rome in 1880 and held numerous posts until he was appointed Professor in 1906, since which time he has been Director of the Oto-Rhino-Laryngological Clinic of the University of Rome.

At one time Dr. Ferreri was on the editorial staff of the *Archivo Italiano di Otologia* and after the death of Massei he became the editor of the *Archivii Italiani di Laringologia*.

Ferreri had many interests in his specialty and has written many interesting articles. One of his latest works was a paper on Septicemia of Pharyngeal Origin, which he read at the Congress in Copenhagen, July, 1928.

He fully deserved the title of "il Maestro" which his Italian colleagues so willingly granted him.

M. F.

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### OTTO GLOGAU.

Dr. Otto Glogau died of cerebral hemorrhage at his home in New Rochelle, N. Y., March 8, at the age of forty-six years.

Dr. Glogau graduated from the University of Vienna in 1906 and soon afterward came to this country. He was continually interested in the poor Austrian children and was the founder of the American Convalescent Home for Vienna's children. For his untiring efforts the Austrian republic granted him a medal as a token of their appreciation of the care and attention given to the sick and poor children of Austria.

Dr. Glogau was a member of the American Academy of Ophthalmology and Otolaryngology and for many years was a collaborator of *THE LARYNGOSCOPE*.

M. F.

